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In Favor of Hydrogymnastics*

By Helen G. Paull

Each type of physiotherapy has certain values which cannot be found in other types, and others which, though found, are not gained as readily or as satisfactorily. I shall try to emphasize some of the advantages of hydrogymnastics as it is done in the pool at the Orthopaedic Hospital-School in Los Angeles.

A brief description of the pool and apparatus is necessary. The pool is twenty feet wide and sixty feet long, and graduated from four and one-half to two and one-half feet in depth. A metal curtain unrolls to divide the pool in half when made advisable by the number of people in the water or by the weather. The shallower half is outdoors and when the curtain is rolled we have a free sweep of fresh air, doing away with the frequently stuffy atmosphere of the ordinary swimming pool. The technicians are always in the pool which contributes to the confidence and comfort of the patients. The technician wears an outfit something like rubber boots which come breast high and keep her dry except for her arms. Seven hours standing in the water would *"warp"* her, as one patient suggested.

A patient comes to the dressing rooms from an outer hallway, preventing any disturbance to patients already in the pool. If ambulatory, he undresses, puts on a bathing suit, and walks into the pool. If not, he is placed on the table, and assisted in changing. The electric carrier is attached to the table top, lifts it free of the understructure, and carries the patient to the pool. When he is lowered to the surface of the water, the technician can easily float him off with no jarring or jerking to hurt painful joints or sore muscles. The patient is then floated over and deposited upon an inclined plinth, which enables his head to be supported comfortably clear of the water and his body to be floated by buoyancy. Adjustable metal arms protrude from a point back of his head and provide an easy method of holding himself secure which adds to his stability and confidence. With a case of infantile paralysis where the shoulder abductors are weak and the abductors probably need stretching, this is the perfect position. However, if the hands or shoulders are not to be used for grasping, a strap can be arranged about the person's chest or thighs and the table so that he feels himself securely held and can relax and attend to the work for which he has come.

The temperature of the water is about 93-95 degrees. This enables a very sensitive or fragile patient to relax and lie quite comfortably in the water when he is too weak or for other reasons may not move about. In a recent case of infantile where kidney involvement is frequent, everything is managed so that the patient

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may receive no chilling. Large warmed towels are thrown over him as soon as the carrier is clear of the water on his way from the pool to the dressingroom.

A pneumatic mattress is used for very sore recent infantiles, or any patient whose extreme emaciation or skin tenderness makes it possible that he might be uncomfortable riding on the wooden tabletop. The patient remains on the mattress until he grasps the plinth, and then it is removed from in under him. When taking out a very weak patient it may be necessary to let the air out of the mattress, slide it under him while he is on the plinth, and then inflate it. This affords painless transportation.

Recent cases of poliomyelitis are put in the pool almost immediately after quarantine is lifted, if there is no kidney involvement or such contraindication. An orderly and an aide in charge of the dressing rooms are trained in the handling of such cases. In fact, definite orders come from the doctor in charge before the first treatment, and the trip from the hospital bed by way of the guerney and the dressing table to the pool is made with no disturbance of the leg and arm position, and with the least discomfort possible. You who have handled a child in that stage of poliomyelitis know the apprehensiveness that is present, more especially if it be a child who is not accustomed to water. But still worse is the adult who is frantically afraid of the water, and has no childlike confidence in older people. Expert attention in the dressing rooms is valuable in preparation for the first treatment.

If there are present weakened quadriceps and ankle flexors wooden splints are applied with straps of webbing to hold the knee extended, and the foot at a right angle. If the hip abductors are so weak that the legs flop apart they are fastened fairly close together, except when they are being exercised, and the fastening is so arranged as to control any unwise rotation of the legs. Hip joints can be exercised more satisfactorily if the knee and ankle joints are stabilized by means of the splints, that is if the muscles surrounding those joints are weak enough to require such help. The splints are removed one at a time to permit exercise of the lower leg muscles.

Care is taken to keep the correct position for the arms and the trunk and neck muscles as indicated by the muscle check which, of course, has been taken before treatment is started. After the first treatment the technician makes a report of the patient's reaction which includes a sort of muscle check in the water, where certain tendencies appear that may add to the information given by the muscle check taken out of water. When the first immersion is finished, and this may last only five minutes, the patient is put carefully back on the carrier, taken into the dressing room, dressed, hair dried thoroughly, and taken back to his bed in the hospital. The time he stays in the pool and the type and amount of activity are carefully graded according to the reactions and to the results as shown by the muscle checks which are taken on the recent cases at least once a month.

Prominence came to pools for their value in the treatment of infantile paralysis, but this is only a portion of the work done. The hydrogymnasium, as its name indicates, is a place where exercises are done in water, giving us another modality in the wide variety known to physiotherapy. It is not exactly a new modality but rather many of its advantages are just now being worked out.

Spastics are taken in a warmer and more secluded pool. Cold makes most spastics still more tense and unsteady, and everyone knows how easily their attention is distracted. So we arrange to have absolutely no interruption, and the increased warmth, 96-100 degrees, aids in relaxation. Efforts are toward quiet, rhythmic and controlled movements. All patients are early taught to float relaxed with their face in the water (jellyfish float) and to open their eyes under water. When this can be done, movements may be taught easily, as fear is entirely removed, and the patient's attention may be concentrated on the effort desired. People who are naturally buoyant and whose body weaknesses are not such as to prevent their being able to hold the body in a straight line, may learn to float more easily on the back. But until they have learned to be comfortable with the face in water there is apt to be present the fear of being suddenly submerged by an awkward movement or by a wave from another person in the pool. This principle is true of all people but it is one most necessary to consider when dealing with spastics. All patients are advised to take a rest of an hour in bed after a pool treatment to add to the good effects, either to complete the relaxation gained, or to rest after concentrated exercise.

There is a salt pool, kept at the same concentration as the ocean, in which are treated the osteomyelitis and other open-wound patients. Activity of the joints close to the wound is encouraged. This helps to clean out the wound, and healing follows. The patients enjoy the treatment, as it is a most comfortable activity and the distressing odor is destroyed.

Injured joints can be brought back to functional activity more quickly and easily in the pool. Warmth of the water brings relief of muscle spasm. Frequently we apply still greater heat through the use of hot water from a hose attached to a convenient faucet. If held from four to six inches from the joint under the water it is very effective, and the injured knee, for example, can be flexed several degrees mor with no pain. Since the pull of gravity does not enter, flexion and extension of a joint can be done with less pain than out of water with consequent improvement in nutrition and prevention of atrophy. The increased range of action has a decidedly tonic effect on the morale of the patient.

A person walking in water of a depth to come up to his shoulders has very little weight upon his feet, in fact it is difficult to keep the heels upon the floor. Therefore an injured and painful knee, hip or low back can function normally and yet painlessly in the deep end of the pool. This is the ideal place to begin weightbearing on fractured or operated hips, and after spinal fusions. To increase the amount of weight borne the patient has only to walk in slightly shallower water. At the shallow end even the smallest children can find their level. Standing or sitting in water of shoulder depth gives us another means of exercising shoulders with muscles weakened from paralysis or injury. Usually the arm will float, but if it tends to sink, due to contractures, for instance, a cork float or an airfilled pillow under the wrist or forearm will hold it up and permit easy shoulder action.

In the pool at shoulder level, grasping a firm support, is where the poliomyelitis cases first stand upon their feet, and later begin to walk. When first walking they may need a rail on each side. As their strength increases they may walk with crutches, although there is a tendency to lean upon the crutches too heavily, and then the feet float up to the surface, especially if the patient's hip muscles are weak, and still more is it likely to happen if the patient is wearing the wooden

splints. It is occasionally necessary to put weights of lead to hold the feet down. With returning strength the water splints may be discarded long before braces are discarded on land.

Instead of crutches we frequently use solid wooden floats upon which the hand and forearm rest. This method calls for more shoulder and trunk work which is frequently desirable. As the patient's strength increases he walks with crutches toward the shallower part.

Compressed air may be made to bubble up through the water and is most comforting and relaxing to a strained low-back or to a nervous, tense patient. We apply it at times in combination with the hot water and with increased force to stiffened joints.

A point to be emphasized is that many cases are given other types of treatment in combination with that in the hydrogymnasium, but not on the same day. They may progress to the pool from other departments. A back injury, for example may go to baking and massage three times a week for a while, coupled with proper bracing and regulation of his activities. After a time, he may graduate to the pool once a week for very careful activities, generally avoiding lateral trunk bending and all twisting movements. Then he may come to the pool three times a week, discontinuing the massage, and his exercises in the water will become more forceful and complicated. He will likely then come to the gymnasium for some exercises to do at home and for instruction in good posture in sitting, standing and in his particular occupation. These different methods of treatment and the proportion and the time when each is begun will be directed by the doctor in charge. The real amount of activity in the pool and the regular gymnasium depends upon the judgment of the physiotherapist, and upon her ability to properly regulate these may depend the success of the treatment. It is an especially happy circumstance when the same technician may carry on the treatment in both departments.

A recent poliomyelitis case will begin baking, massage and carefully graded muscle training as soon as most of the muscle soreness has disappeared, which may be at the same time pool treatment is started, or may be somewhat later. Sinusoidal may be given to the abdominal muscles during this time. Weakness of the trunk muscles may be exercised more satisfactorily in the water than on the table. It is of value that the back and abdominal work may be graded easily from the very lightest effort to other movements which will make a healthy adult admit, "That is a good exercise." If the patient can float relaxed face downward and attempt lateral or forward trunk flexion the delicate inequalities of muscle action along the spine are very distinct and so can be carefully and correctly exercised.

The pool is the ideal place to work on trunk, hip or shoulder weakness, but if the paralysis is localized in the hand or foot usually one can obtain more concentrated effort from the patient by means of baking, massage and muscle training. A point to be emphasized is that hydrogymnastics alone is occasionally not as satisfactory as a means of treatment as it is when used in combination with others.

The best results are gained when each patient may be taken alone and receive the undivided attention of the technician, and of course, give undivided attention. Each treatment lasts thirty minutes, except with recent poliomyelitis cases and any others whose weakness makes it wise to have the period shorter at first. When possible it is more effective to keep the patient in the pool the allotted time but grade the strength of the activities, and also the length of the rest periods between each movement so that very little fatigue is produced. The patient need not know he is being so carefully guarded, and he believes himself capable of doing half an hour of work, which is good for his morale.

Children and older patients, love to have a free period when they may move about in the water, not "under orders." It sometimes brings good results to let them have this period as they will work attentively for twenty-five minutes for the privilege of five minutes free. But this period is under the supervision of the technician and no movement is permitted that could stretch or harm weakened muscles, or cause undue fatigue. The patient should not be permitted to play about while the technician's attention is diverted.

Underwater activities are good for neurotic patients who are sure they are incapable of certain motions. Even if the patient is a good swimmer, the movements he is asked to do in the pool are so unlike the stunts he may have performed before, that without realizing he does what he insisted he could not do. When the force of the exercise has been gradually increased it is enough to prove to him that he is capable of the same movement out of water.

General posture and scoliosis cases may derive considerable benefit from hydrogymnastics. Many water stunts and certain regulation swimming strokes, if taught correctly, and others if adapted slightly, are very good for posture. If the patient has been in the usual gymnasium for some time he will take a new interest in attacking the problem from another angle, and will work with increased vigor. Another advantage is that patients may practice in public or private pools and will put in a great deal more work on the condition. For instance suppose the patient to be a small boy who, due to financial conditions, can come in for treatment only once a week. Doing exercises at home twice a day is apt to lose charm in spite of the physiotherapist's ingenuity in devising exercises he will enjoy. It will be a pleasure to practice vigorously three times a week in a public pool and then report once a week to the hydrogymnasium for more stunts and for further criticism in improving his strokes. It is quite necessary that the instructor know the very latest details of each stroke or she will lose the boy's confidence in her ability. If she can say "That is the correct way to do that stroke, but we will do it this way until your round shoulders are corrected," she will not only keep his faith but he will work hard until he may do the strokes which at present must be prohibited. People usually enjoy doing anything they can do well and it is quite probable that the boy will continue to swim these strokes and do these stunts after he is released from our supervision. It is a valuable adjunct in making his improvement permanent.

Another point in favor of hydrogymnastics is that to children and adults alike it is the most enjoyable form of treatment. To young children anything connected with the water is a joy. Children in their teens enjoy exercises which make for perfection or movement and rhythm in the water. The adults who tell me immediately, "I just swim, I've never had any lessons" are eager to improve their ability and assurance. People who always have been afraid of the water gain confidence as they lie securely on the plinth, becoming accustomed to rhythmic but definite movements. The

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fact that these movements are carefully chosen for the particular difficulty for which the patient comes does not interfere with his pleasure in movement in a different element. And when he is able to float relaxed both prone and supine, perhaps opening his eyes to watch his shadow on the bottom of the pool as he does slow arm and leg exercises, he has gained a new accomplishment. His joy in that possession aids his recovery. Mothers are anxious to feel more confident in the water so they will not have to sit on the sideline while their children swim. Sixty year old ladies and gentlemen work eagerly, if somewhat awkwardly and self-consciously at first. All this enthusiasm is used to secure accurate and co-operative work on the condition for which they are having treatment. I think this natural interest comes to the aid of no other type of physiotherapy.

Summarizing, the main points in favor of hydrogymnastics in comparison with other branches of physiotherapy are that by means of it we secure:

1. Earlier treatment in poliomyelitis cases, relieving muscle soreness, increasing nutrition and preventing atrophy.
2. A greater range of movement with weakened muscles, a source of encouragement to the patient.
3. A greater range of painless movement in traumatic cases.
4. More exercise with less fatigue.
5. Any concentration of exercise, slight or heavy, for any or all parts of body in one treatment.
6. Early treatment for post-operative cases.
7. Logical place to begin weight-bearing for poliomyelitis, injuries and post-operative cases.
8. Unique treatment in specialized pools for spastics and osteomyelitis.
9. Pleasingly different method of attack on chronic cases and on neurotic patients.
10. Corrective swimming and stunts which carry over into recreation hours for posture and scoliosis cases.

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Massage and Mobilization in the Treatment of Traumatic Conditions Including Fractures and Dislocations*

By Carolyn M. Brown

The conditions under discussion in this paper may be described as cases of trauma resulting in disfunction of skeletal structures. The stage of the process necessarily conditions both the treatment and the result; so for convenience the treatment may be considered under the headings acute, subacute and chronic. As a premilinary to the description of any method, we must consider briefly the conditions to be treated. Trauma produces effects in two ways: first, directly, by the application of a force which exceeds the elastic limit of the structures acted upon, as in fractures, dislocations, ligamentous tears and sprains, partial or complete avulsions of tendinous insertions, ruptures of muscles and all other tissues, including blood vessels and nerves; and second, by reflex action through the sympathetic system resulting in a vaso-dilation of the part with the resulting increased blood supply and engorgement of lymph spaces. This, combined with the extravasation of blood, accounts for swelling.

The local signs of trauma may be swelling and discoloration and in the case of fracture or dislocation there may be gross deformity and a false point of motion.

Obviously, the treatment should consist first, in an anatomical adjustment of the displaced structures, if such a condition exists. It must not be assumed that any system of Physical Therapy, however well directed, will produce satisfactory results in cases in which a preliminary adjustment of a fracture is inadequate.

For the present discussion, we must classify those traumatic cases which may be treated primarily by Massage and Mobilization. In a general way, it may be said that cases suitable for this type of treatment are those in which there is either no gross deformity or in which deformity is not likely to result from the treatment. A proper selection of cases must naturally depend on experience but it may be said that such injuries are usually those in or about the joints and are rarely complete fractures of the shaft with displacement or compound fractures. Injuries which require an open exposure with some form of internal fixation such as a complete fracture of the patella or the complete rupture of any vital structure are not included among those cases in which Massage and Mobilization may be used as the sole method of treatment. It must be understood that Massage and Mobilization has a wider field of application than any other single method because it may not only be used in a very large number of cases such as have been described, but may also be used in conjunction with other methods when motion may be instituted or conditioning of the soft tissues may be undertaken. In fact it may be said that this type of treatment is indicated either as the sole or chief method of treatment, or in conjunction with other methods in all cases where the function of movable parts of skeletal structure is impaired.

It must not be assumed that neglect or failure to provide suitable protection is advocated in this form of treatment. On the contrary, much closer supervision and care to prevent displacements and deformity are required where early mobilization is used than in cases which are treated by other methods. Early motion, unlike the active motion used after there is fixation of the fragments by callus, is to be undertaken only under very careful supervision. The part must be protected against injury and deformity by suitable splints and dressings between treatments.

It may be added that where neurological changes occur as indicated by paralysis of muscle groups, the treatment is modified so as to include support of the affected muscles in a relaxed position, such support to be effective at all times between treatments. The prevention of loss of contractility and elasticity is of paramount importance because in such cases there is the additional factor of the loss of enervation to complicate the muscle imbalance. Injury and obstruction to the circulation must be compensated for by a temporary compromise in position between treatments. For instance; in a fracture of the elbow a position of acute flexion may be indicated

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to maintain a correct relation of the fragments, but for the first few days or until a sufficient reduction of the engorgement of the lymph spaces can be accomplished by massage and motion, it is necessary to limit the flexion to the point where the circulation is adequate in the extremity.

The objective which has been attempted in early mobilization of fractures has been to devclop a method which would allow the widest range of function for the soft tissues and at the same time maintain an unchanged relation of the fragments. The degree of trauma and inability to obtain reasonable apposition of fragments materially affect end results.

In attempting early motion the first essential is relaxation, which must be attained before any motion is attempted. Patients suffering pain and shock cannot simply be adjured to relax and be expected to do so. They should be placed in a comfortable position conducive to relaxation with the injured part well supported, a little heat applied followed by light stroking massage for the relief of pain or discomfort due to swelling. Relaxation will be achieved progressively as the swelling subsides. It is however accomplished much more easily in subsequent treatments because the patient has experienced no discomfort during the first treatment and understands what is expected.

The purpose of the light stroking massage is for the relief of muscle spasm, the reduction of the engorged lymph spaces, and to induce relaxation. It is never the application of heavy or forceful pressure but a light soothing rhythmical stroking started above the injury to increase the lymphatic and venous circulation proximally, thereby assuring a more effective emptying of the vessels at the site of the injury. Rhythmic stroking is particularly emphasized in the early treatments because it eliminates any residual tension on the part of the patient. Uneven or arhythmic stroking causes the patient to be apprehensive and to anticipate strokes, thus delaying relaxation. If this massage is started before there is much swelling it will help to prevent excessive swelling by lessening the flow of blood to the part and by improving the return circulation. At this time minor adjustments of fragments may be made painlessly. In the case of marked swelling, massage is used to control and reduce the swelling and for relief of pain. It will also tend to permit motion in neighboring joints without displacing the fragments.

The motion used at this time, and as long as there is any sensitiveness, is entirely the action of gravity on the relaxed extremity. This massage and relaxed motion is given once daily as long as there is any sensitiveness. As soon as the sensitiveness subsides active motion and muscle setting are substituted, followed by active supported (active assisted motion) graded to active resisted and conditioning exercises. The muscle setting is used only for those muscles in which there is a tendency to loss of contractility. Usually when active motion is begun, treatment three times a week is minimal. At this stage fixation may be discarded and slings or bandages used as long as any support is needed to gain either flexion or extension. Passive motion, even that which is described as gentle and mild is never used in this method, because no force other than that of gravity on a relaxed extremity is necessary up to the time that active motion is started.

Where an injury has progressed to the chronic stage with associated fibrosis, before coming under treatment, either wedging plasters or repeated moderate stretching under an anaesthetic may be indicated. However, this last applies to neglected cases and forms no part of the treatment under discussion.

The following is a brief description of the treatment of shoulders, elbows, and knees.

SHOULDERS

For fractures of the proximal part of the humerus, the treatment consists of placing the patient in a comfortable sitting position without elbow support and administering heat and massage as previously described. Heat and massage are applied once or twice daily for a day or two or until the patient has recovered from the shock and immediate effects of the injury, before motion is attempted. The fixation is a handkerchief sling, abduction pad and a circular bandage which is applied so as not to support the elbow. The circular bandage is only used for a few days for the purpose of stabilizing the part.

For relaxed motion or circumduction of the shoulder the patient bends the trunk forward from a standing position and rests the forearm of the unaffected side on a table for partial support. Then, following massage for relaxation of the affected shoulder and arm, the patient's body is moved from the hips in such a way as to cause the arm to swing in circumduction without muscular effort on the part of the patient. Swinging in abduction and adduction may be used in addition to circumduction.

If any difficulty is experienced in obtaining relaxation at this time a suggestion is made to the patient that he note the weight of the hand of the dependent extremity. No attempt is made to move the part unless relaxation is complete.

Active swinging is substituted when the sensitiveness subsides. It is started with the same position as for relaxed motion; the trunk is gradually allowed to extend, and the range of circumduction of the arm increased at the same time.

This technique may be used also in fractures of the scapula and clavicle as well as in acromio-clavicular separations immediately or following immobilization covering a sufficient period to insure fixation.

Gatch beds with the patient in the partially recumbent position for rest have been used between treatments making sure that the elbow is not supported in such a way as to nullify the effect of gravity on the shoulder.

ELBOWS

Fractures and dislocations about the elbow, exclusive of fractures of the olecranon, following reduction and fixation in the position of acute flexion, are treated with the patient in a partially recumbent position, and the elbow comfortably supported on pillows. The technique described for relaxation is applied, and the forearm carefully supported, is very gradually allowed to extend by the action gravity. Motion in extension is stopped if there is any evidence of muscle spasm or discomfort on the part of the patient. While the degree of extension obtained is carefully held, a little massage may be administered above the elbow for the purpose of improving the return circulation. Elevation of the arm from the shoulder will allow the elbow to be returned to its original position of flexion by the action of gravity. It must be supported in such a way as to insure a very gradual and uniform rate of motion. If the range of motion becomes decreased from day to day during the treatment, it is probably due to loss of elasticity of the soft tissues on the flexor aspect, resulting from the extended period of fixation in acute flexion. Avoiding massage of the flexors and increasing stimulation of the

extensors will tend largely to prevent limitation of extension.

The degree of supination or pronation of the forearm to be maintained during treatment is determined by the tendency to deformity as noticed by an increase or decrease in the carrying angle, and it also depends on the exact nature of the injury.

The fixation adhesive band should be applied without any unnecessary motion of the joint and must support the carpometacarpal joints on the ulnar side. Failure to observe this may result in more sensitiveness about the wrist than the elbow.

This treatment is followed, as in shoulders, until the sensitiveness disappears; then the fixation is discarded, a sling applied and graded active motion used.

Simple dislocations of the elbow and fractures of the head or neck of the radius without displacement respond to this treatment very satisfactorily.

KNEES

Fractures involving the knee joint, are first treated by support in extension with a posterior molded plaster splint, extending from the upper part of the thigh to below the calf muscles. An efficient method of constructing a posterior splint, is to apply a long boot or cylinder and to remove the anterior third after drying. Proper alignment of the thigh and leg is maintained with this splint. Within 24 to 48 hours after injury, relaxed motion is started in the following manner: The bandage is removed and the limb, resting in the splint, is treated with heat and massage. The whole limb is then gently elevated without flexing the knee until the heel is approximately twelve inches from the bed. This is accomplished by supporting the limb under the knee and at the ankle. The supported ankle is then gently lowered to allow flexion of the knee. This is painless if the correct alignment is maintained during the procedure. Following this the knee is then carefully lowered to its former position of extension and the splint replaced. This treatment is repeated daily until active motion is substituted, at which time it should be preceded by quadriceps and hamstring setting. The muscle setting used is not sudden and incomplete contraction but a prolonged contraction of the entire muscle from origin to insertion. The molded plaster ham-splint is not discarded until active motion is well advanced in any case where there is a tendency to lateral motion of the knee. The post-operative treatment of fractures of the patella, as well as those reduced by the closed method, are treated by early motion in this manner, and are supported with an ace bandage.

A criticism has been that this method is used exclusively for children. It so happened that most of the cases cited in the preliminary report were in children, but it has been found just as useful in adults as demonstrated in the illustrations.

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The Use of Electropyrexia in Gonorrheal Arthritis*

By Rodney F. Atsatt, M.D., F.A.C.S., and Luella E. Patterson, Physical Therapist

The introduction of hyperthermia in the form of electropyrexia[1] has ushered in a new day in the treatment of several of our chronic diseases. In time to come perhaps many more will fall before the "cleansing fire" of electrically generated heat. Suffice it to say, however, that neuro syphillis, multiple sclerosis, intractable asthma and several forms of arthritis have been benefitted to a greater or less degree by hyperthermia.

APPARATUS

Let us consider the apparatus for the production of this fever therapy. In our experience three pieces of apparatus are necessary. The first is a rugged diathermy unit, the second is a hot air cabinet and the third is a suitable set of electrodes.

The production of a satisfactory high frequency current requires a diathermy unit which will deliver 6000 M.A. of smooth current, easily regulated in small gradations. It should be capable of maintaining this delivery for two to three hours without signs of an overload.

The hot air cabinet is easily constructed out of celotex panels set in a wooden frame, insulated by a blanket covering. The one essential requirement is that it be spacious enough to allow the patient to flex his knees without restriction and without danger of burns from the electric heating lights. We have found 2.6x2.0x6.6 to be the ideal dimensions. The head end is enclosed and insulated by rubber sheet and blanket drops to be tucked in about the patient's neck. The heat is furnished by ten, sixty watt carbon filament lamps. The optimum air temperature in the cabinet has been found to be 120-140° when the diathermic current is turned on and from 140-160°F. when the current is off and it is desired to hold the temperature of the patient. This is well tolerated by the patient and is controlled by an ordinary thermometer and a handy switch. A shallow pan of water with considerable evaporating surface is suspended inside the cabinet to increase the humindity and thus reduce the heat loss from sweat evaporation. The cabinet is swung from the ceiling by means of ropes and pulleys for ease in manipulation.

For electrodes we formerly used the Neyman[2] type but later found that a simple unfenestrated sheet of block tin, guage No. 28, mounted on a ⅜ sponge rubber backing, applied over a ¼ inch absorbent pad moistened in normal saline, to be more satisfactory. This interposition of the wet pad requires somewhat higher milliamperage but we feel that it is far safer than the bare tin. No burns have resulted as yet in a series of 250 treatments and the patient seldom complains of, nor is the treatment interrupted for "hot spots." The electrodes are of similar shape to the Neyman type and are applied in a similar manner by means of a canvas corset.

A fourth piece of apparatus which is of considerable advantage to use but which is not absolutely essential in the temperature range in which we have worked is an electric pyrometer for indicating or registering rectal and axillary temperatures. So far these pieces of apparatus are costly, cumbersome and delicate although we understand an instrument will shortly be on the market which will obviate some of these drawbacks.

*From the Physical Therapy Department, Santa Barbara Cottage Hospital.

TECHNIQUE

The details of technique are difficult of adequate explanation, for so much of one's success depends upon a nicety of judgment which is acquired only by experience. Following the suggestion of Warren and Wilson[3] we have used preliminary sedatives. They offer as the most useful, sodium bromide grains 30 and barbital grains 10 to be administered two hours before the treatment is begun. Chloral hydrate grains 7½ is given by mouth at the beginning of the treatment and may be repeated three hours later. We have found this combination to be very satisfactory, allowing the operator to easily awaken the patient to inquire as to comfort and, after an intelligent answer to the question, the patient will immediately drop off to sleep again. During these waking moments and after every 15 minute mouth temperature recording, unciced water is given by mouth.

As the temperature rises the patient may become increasingly restless until at about 102.5° it is often necessary for the operator to use her full powers of persuasion to keep the patient under control. For pure nervousness or a combination of nervousness and discomfort and after checking the temperature rise to be sure that it is not being elevated too fast, several things can be done to relieve the condition. Fanning the patient's face with an iced towel is excellent practice, the constant exchange of cool dry pillows and engaging the patient in quiet conversation about something of known interest, are great helps in quieting the nervous person. Above all, however, there should be the appearance of a reassuring calm and simple self confidence on the part of the attendant. As the temperature is elevated still further this period of excitement is diminished and unless a semi-delirious state ensues the patient can then be carried to the desired height of fever. If the subject becomes nauseated or extremely exhausted, all active heat should be turned off. The intermittent application of iced towels to back of neck, forehead and cheeks is permissible but it should be remembered that by contrast, after the use of cold towels, the heat becomes the more unbearable to the patient and also that some heat is lost by constant application of cold to the head. Sips of ice water or the use of small amounts of cracked ice are also permissible to relieve the exhaustion or nausea. Soda bicorbonate grains 5 or 10 sometimes helps. Alternate raising or lowering the head may give relief. The careful attention to details is no small part of the success of the treatment and it is recommended that each and every attendant on hyperpyrexia treatments be given at least one treatment themselves, in order that they may appreciate the actual conditions under which the patient is existing.

The pulse, temperature and respiration should be carefully recorded every fifteen minutes during the early stages and oftener as the treatment progresses. If dependance is placed on mouth and axillary recordings for estimating temperature rise, the thermometer should be left in place for five minutes and the pulse and respiration recorded for the final minute of each five minute period. Indications of circulatory collapse such as intense facial cyanosis, circumoral pallor, rapidly increasing pulse rate or markedly falling blood pressure are sufficient points of evidence on which to terminate the treatment. Needless to say no treatment is ever started without careful preliminary physical examination, and severe cardiac disturbances, marked arteriosclerosis and nephritis are usually excluded from this procedure. Careful watching of all patients is a necessary watchword.

The electrical apparatus is used as follows: The plugs, marked for identification, are connected to the diathermy unit and the electrodes are applied over the moistened pads by means of the snugly fitting corset. On an initial treatment a gradually increasing amount of current is released to the electrodes, the intensity depending on the size of the individual and the type of temperature curve desired. On subsequent treatments, however, the optimum milliamperage is known and the adequate amount which will, together with the cabinet heat, give a constant rise of 0.8° to 1.0° every fifteen minutes is selected. In general, the faster the rise can be obtained, the less fatigue will the patient have to endure, but one should be guided always by the changes in pulse rate and circulation and usually a rise of more than 0.8°-1.0° per fifteen minute interval has been found to be unwise because of later exhaustion and restlessness which necessitates interruption of the procedure. The maximum temperature necessary to obtain with the diathermy apparatus in the type of treatment under discussion is, we believe, in the range of 103° to 104° and usually can be reached in 1½ to 1¾ hours. If desired, the rise can be continued by allowing curve to coast up of its own momentum aided by the external heat of the cabinet. We have found 105° to be sufficienty high to obtain satisfactory clinical results. We plan to hold a temperature above 103.5° at least 2 to 6 hours. The electrodes may be removed through the head end of the cabinet, without exposing the patient, at any time after the diathermy is discontinued. The cabinet is usually removed when the temperature has descended to 100° and at that time iced fruit juices are slowly given. As before mentioned, the art of administering the diathermic current and cabinet heat in consonance with the patient's individual reaction is a great factor in the success of the treatment and can be gained only by experience.

GONORRHEAL ARTHRITIS

The arthritic manifestations of gonorrheal infections are the most common of the systemic results. According to Jeck[4] from 1 to 3% of those suffering from gonorrhea develop this complication. In the male the seminal vesicles are apparently the focus of infection. The mildest type of arthritic infection is the serous, then there is the sero-fibrinous, the rare empyemic, and most serious, the phlegmonous.

Many remedies have been suggested in treatment but by their very multiplicity they announce their ineffectiveness. Stripping of the seminal vesicles is probably the most universally accepted means of getting rid of the focal infection. Non specific protein therapy with typhoid vaccine intravenously, and milk, aolan omnadin and other products subcutaneously have been tried. Specific vaccine and sero therapy have been used also. Salicylates, potassium iodide are medicines employed at times. Occasionally resource is had to surgical removal of the focus such as seminal vesiculatomy or vesiculectomy.

None of these procedures have given satisfaction however. In analyzing the results with hyperthermia of Warren and Wilson[3] it is found that of the 14 female patients with cervicitis or salpingitis or both who received adequate treatment in their estimation, 10 or 71% showed negative smears up to from 1-4 months, indicating an apparent change in status of their localized infection as the result of general hyperthermia.

RESULTS OF TREATMENT

The results we have obtained in gonorrheal arthritis with electropyrexia have been very satisfactory. Bishop, Horton and Warren[4] report the use of hyperthermia in the treatment of nine cases of specific arthritis with excellent response. Our small series of 8 cases with 85%

recovery is offered as confirmatory evidence that acute gonorrheal arthritis can be successfully treated by electropyrexia.

CASE HISTORIES:

1. F. K., male, aet 19, acute G. C. urethritis for three weeks. For three days had had an acute G. C. arthritis in right wrist and left elbow with increased heat, swelling, pain and tenderness. The first electroyprexia treatment with the temperature over 103.5° for only one-half hour gave partial relief and the second elevation of four hours over 103.5° gave a complete recovery both of the arthritis and the urethritis. Smears negative over a period of four months.

2. W. M., male aet 42, acute urethritis for fourteen days followed four days later by swelling, heat, tenderness and severe pain in a previously sprained right ankle. The first electropyrexia treatment of two hours over 103.5° gave considerable alleviation of the pain—so much so that he insisted on a second treatment four days later, this time holding a temperature over 103.5° for 2½ hours. A third treatment of one hour over 103.5° gave a practically complete recovery which was made absolute by a short course of baking, massage and exercises. Smears, negative for two months then became positive, possibly due to reexposure. Became negative again on conservative treatment. No return of arthritis.

3. F. J., male, aet 55, acute urethritis followed by acute G. C. arthritis in left hand, wrist and elbow and right knee for nine weeks. Electropyrexia attempted but unable to go above 100.8° because of cardiac distress. Hyperthermia attempted by means of hydrotherapy (continuous hot baths). Average temperature reached was 102°, but all elevations were held for less than ½ hour. Six months later was given three electropyrexia treatments averaging three hours at 101°. Patient continues to have residual stiffness and considerable limitation of motion in the affected joints, though pain is considerably diminished. Smears remain positive.

4. A. L., female, aet 19, vaginal discharge for two months. Sprained right ankle followed by G. C. infection presenting hot, acutely tender, red, and swollen right ankle. Pain almost uncontrollable, a true phlegmonous arthritis. Subcutaneous abscess opened and drained. Otherwise treated conservatively for two weeks. Treated with electropyrexia at weekly intervals for five treatments. Temperature sustained above 103.5° for 1½ to 2 hours on each treatment. Acute symptoms partially relieved with each treatment. Given baking, massage and exercise for slight residual stiffness with final complete recovery of ankle and negative smears one month later.

5. W. D., male, aet 47. Repeated G. C. infections ages 18 to 24. No recent discharge, but recent burning on micturition. Acute arthritis in both knees with joints hot, swollen, tender and painful for eight weeks. Single electropyrexia treatment with temperature above 103.5° for three hours gave complete recovery except for slight stiffness, but no real limitation of motion. This patient was a severe diabetic. Patient lost sight of and results of smears unknown.

6. T. P., male, aet 46, G. C. infection 18 years ago with intermittent discharge since—present especially during past year. Acute, hot, painful and swollen right wrist for one week. Single electropyrexia treatment with temperature above 103.5° for 2½ hours gave complete recovery of arthritis though discharge has continued with positive smears.

7. H. W., male, aet 42, G. C. infection for four weeks. First noticed pain in left wrist 10 days ago while at work. Within a few hours was hot, red, swollen and painful. Involved the metacarpo-phalangeal joints also. The first electropyrexia treatment with four hours above 100° gave partial relief of symptoms together with a complete relief of pain. It is interesting to note that pain was uniformly relieved at the height of the fever in all cases and in several cases did not return. The second treatment, two hours above 101° gave further relief, the only residual being slight limitation of motion in the wrist. This disappeared within a few days. Smear negative two weeks later. This patient had mild cardiovascular difficulty.

8. C. R., male, aet 25, G. C. infection for six weeks, urethritis for five weeks, epididymitis for four weeks. Received irrigations with no relief. Developed acute prostatitis and arthritis left elbow. Single electropyrexia treatment with temperature above 103.5° for three hours. Swelling, pain and tenderness immediately left the elbow, epididymis and prostate. Discharge ceased—smears became negative—were still negative at two months. Complete recovery.

The above resumés present in a graphic manner the spectacular results obtained. In case three we feel that it was an error in judgment to have given the series of brief hyperthermia treatments by means of the continuous hot bath. The short exposure to an elevated temperature possibly allowed the organisms to gradually accustom themselves to increased heat and thus rendered ineffective our attempts at electropyrexia later.

Another case is presented simply as a matter of interest as there were no arthritic manifestations.

9. E. D., male, aet 25, G. C. infection four years ago. Recent discharge associated with severe pain and swelling in testicle and pain in lower abdomen. Smears positive. Single electropyrexia treatment with temperature above 103.5° for five hours. Great symptomatic relief, swelling in testicle reduced, discharge became watery and ceased. Smears negative three months later.

SUMMARY

I. The apparatus for use in electropyrexia treatment is described.
II. A discussion of the procedure is given in detail.
III. The technique of the treatment is outlined.
IV. Evidence is offered to show a recovery in seven out of eight cases of gonorrheal arthritis treated with electropyrexia as well as the loss of organisms, temporarily at least, from the local sites of infection in six out of the eight cases.

Santa Barbara Clinic.

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Officers and Executive Committee of the American Physiotherapy Association, 1932-1933

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EDITORIALS

Convention

The 12th Annual Convention is over!

It is with a degree of trepidation that the convention committee watches the approaching date for the great opening and they scarcely rest until the last meeting is adjourned, the delegates have said their good-byes and the last vestige and sign of convention is carried away.

The opening tea on Wednesday p. m. marked the usual note of sociability and little groups here and there were heard recalling friendships and exchanging greetings. We were a cosmopolitan group for the registrar showed us that delegates hailed from California to New York and from Texas to Minnesota—all gathered in the name of Physiotherapy.

Of special interest was the display of scientific exhibits and much of the hand work from the Spalding and Christopher Schools in Chicago. Pictures of Miss Plastridges' work at Warm Springs are identical with those shown at a Century of Progress. A fine book display included a number from Northwestern University and a number of braces, pictures and shoes were on exhibit. Miss Hindman and Miss Foss had a model of their extensive treatment center in Minneapolis.

The program as reported in the REVIEW speaks for itself. Perhaps the high light of inspiration was gained from Dr. Earl R. Carlson of the Neurological Institute of New York. He gave us more than theory and observation in the treatment of the spastic child, for his own experience and growth of mind and body were illustrations of his ability to put his theories to use.

The officers' luncheon had just the touch of informality and freedom which gave us a real opportunity to meet and visit with that smaller group who are meeting problems of individual chapters. After we satisfied our hunger with grand food we relaxed and began the round of introductions and questions which are in the foreground. The financial situation and methods of increasing our national working fund were under discussion.

Friday was marked with a red letter. Because the Chicago Schools were closed early, the morning program was changed to a Demonstration at Northwestern University on Fever Therapy, a clinic at Passavant Hospital on "Infections of the Hand" a trip to Spalding School by bus and finally a touch of atmosphere with a luncheon at "A bit of Sweden." We ate "Smorgusbrod" and liked it!

Perhaps the most involved discussion was the revision of the Constitution as presented by Miss Edith Monro. The details are not presented in the REVIEW but we trust the delegates will clearly present the changes recommended and the reasons for them. Especially important is the matter of dues and the executive secretary. Members should carefully read the Treasurer's report and see why our organization must have adequate help in caring for routine. Surely the majority of members would rather pay to have some of this work done than give their time.

Finally the grand social event was the banquet. As the programs stated this was informal and our good friend Dr. Coulter presided as a genial toastmaster. Dr. Pemberton, Dr. Osgood and Dr. Lewin not only gave us their speeches but entertained us with their good stories as well.

The Century of Progress was no doubt a "drawing card" to Chicago but our friends and delegates were most loyal to the P. T. A. Convention for the meetings were unusually well attended. We feel we had a real place in this Century of Progress for certainly an organization which has grown from such small beginnings in twelve short years has shown a "progress" which can scarcely be excelled by other groups.

We enter another year. May our "progress" be marked.

President's Address

Few people arrive at a very high place in this world without having aimed at a definite goal.

In an organization this is truer than with individuals and concerted action is essential if an organization is to live and thrive.

We preach "prevent deformities," "prevent disease," but do we practice what we preach? Should we not look ahead to prevent some of the maladies that attack organizations?

The nursing profession may well give us warning as to complications that may arise in our profession. For many years hospitals felt it was much cheaper to have care of patients provided by student nurses than by graduates. But while some schools maintained a high standard of education others were on a lower plane and thousands of nurses were graduated each year. They

were soon confronted with overproduction and unemployment.

They have been forced to adopt as a solution to this problem higher standards for schools and limited enrollment. It seems to me that while we are yet a young organization, and before the disastrous results of such conditions should overtake us, we should use our efforts to prevent such a possibility.

On the whole we have had splendid cooperation from schools in maintaining high standards in physical training. The day of apprenticeship has passed, and it is not fair to have an intelligent student spend time in informal training without the background of an approved school. I urge every member of the American Physiotherapy Association to discourage the giving of such training and to discourage students from taking such courses. I would also urge those of you who are teachig in approved schools to accept only high type students with good background and intelligence.

The time is not far off when we will be forced to fight for legislation in self defence. Unless every member of the organization works toward definite contacts which will give us strength in time of need, we will not be able to carry through the type of legislation we desire.

Last but not least—the work of the National Association has long since ceased to be informal and of little importance. The Executive Committee acts as a clearing house for the chapters. If you can picture banks trying to carry on their business with all of the clearing house officers doing their work after they have finished their regular jobs, without a paid secretary to write their letters and without even an office, you can understand why many important telegrams, letters, etc., to the Executive Committee must wait until the officers can get away from their work to hold the necessary conferences to take care of this business.

We realize that this is no time to increase expenses but we want those who are not familiar with the duties of the Executive Committee to understand how the organization is handicapped in trying to transact business efficiently without an office or a paid secretary to do the routine work.

Will you think over these matters with as much interest and concern as you would your own individual problems and let us all contribute to working them out. Do not leave it to the officers and committees. The things which affect our organization will in turn affect us individually.

Treasurer's Report, 1933

I am again pleased to submit the Auditor's report for the year ending April 30, 1933.

The May report shows $169.73 received and disbursements of $19.68. This leaves a balance on hand May 30, 1933, of $1,561.70.

In spite of rigid economies in all lines it has been impossible to avoid a small deficit. A careful review of reports for several years would indicate that the income of the Association is scarcely able to balance the necessary expenses. It would appear that no expansion of the activities of the Association or of the REVIEW can be undertaken until income is increased.

The splendid cooperation commented upon in previous reports has again been shown by the Chapter treasurers and members at large who have made possible the splendid showing in the collection of dues this year.

Respectfully submitted,

MABEL E. HOLTON, Treasurer.

Auditors Report

May 8, 1933.

American Physiotherapy Association,
Ann Arbor, Mich.
Ladies:

At the request of Miss Mabel E. Holton, Treasurer of the American Physiotherapy Association, we have made an audit of her records for the year May 1, 1932 to April 30, 1933. We have also examined the record of the Revolving Cash Fund for the PHYSIOTHERAPY REVIEW (Schedule A-1) and have traced the receipts therein recorded to the Treasurer's records.

The total recorded receipts were traced to deposit in the bank. Each disbursement was examined and proper authorizations were found to be on file. The balances in the commercial and savings accounts were verified by the Ann Arbor Savings Bank.

Schedue A is a Statement of Cash Receipts and Disbursements for the year ended April 30, 1933. The total cash receipts for the year were $4,285.18 while the disbursements including returned checks were $4,403.68, an excess of disbursements over receipts of $118.50. Cash on hand April 30, 1933, amounted to $1,964.20. Included in the disbursements is an over-payment to Kable Brothers Company of $7.70. A credit memorandum for that amount has been received from the company. It is also to be noted that there is a deficit of $11.23 in the Revolving Cash Fund of the PHYSIOTHERAPY REVIEW. A check is to be issued by the treasurer for this amount.

Schedule A-2 presents a Statement of the Cash Balances, April 30, 1933.

Very truly yours,
F. E. Ross & COMPANY, by F. E. Ross.

STATEMENT OF CASH RECEIPTS AND DISBURSEMENTS
MAY 1, 1932, TO APRIL 30, 1933

Receipts:			
Membership Dues:			
Senior Members	$3,279.00		
Junior Members	147.00		
Associate Members	50.00	$3,476.00	
PHYSIOTHERAPY REVIEW (Schedule A-1):			
Subscriptions	$ 339.45		
Sale of Extra Copies	8.70		
Sale of Reprints	40.00		
Advertising	275.72		
Refund—Advanced for Illustration in REVIEW	8.13	672.00	
Convention Registration		37.00	
Appointment Bureau Fees		42.00	
Sale of Pins and Emblems		29.48	
Interest Income		16.23	
Refund—Advanced for Eastern Sectional Meeting		2.12	
Miscellaneous		10.35	
Total Receipts			$4,285.18
Disbursements:			
Auditing		$ 40.00	
Bureau of Appointments		15.00	
Check—Tax and Exchange Fee		1.73	
Committee Expenses:			
Educational	$ 19.00		
Executive	85.36		
Legislation	2.40		
Membership	11.35		
National Publicity	3.00		
Revisions	5.00	126.11	
Conventions:			
Printing	$ 21.75		
Program	7.00		
Report of Proceedings	141.83		
Traveling and Miscellaneous	578.58	749.16	
Office Supplies and Miscellaneous		51.25	

PHYSIOTHERAPY REVIEW:		
Editor's Expenses	$ 27.29	
Printing	3,055.66	
Typewriter Repairs	6.00	3,088.95
Pins and Emblems		56.60
Postage		141.46
Printing:		
Membership and Application Blanks	$ 21.79	
Reprints	7.75	
Stationery	60.88	
Tentative Constitution	32.00	122.42
Refund—Dues		2.00
Returned Checks—Bank Moratorium		4.00
Treasurer's Bond		5.00
Total Disbursements		4,403.68
Excess of Disbursements over Receipts		$ 118.50
Add: Cash on Hand, May 1, 1932		2,082.70
Cash on Hand, Apr. 30, 1933		$1,964.20

REVOLVING CASH FUND—PHYSIOTHERAPY REVIEW—MAY 1, 1932, TO ARIL 30, 1933

Receipts, May 1, 1932 to April 30, 1933	$ 728.70	
Less: Returned Items—Bank Moratorium	8.50	
Net Receipts, May 1, 1932 to April 30, 1933		$ 720.20
Less: Amount Transferred to Treasurer:		
Recorded by Treasurer (a)	$ 661,00	
Items in Transit	24.75	
Returned Items—Bank Moratorium	8.50	694.25
		$ 25.95
Less: Disbursements:		
G. Beard—Payment for Extra Copies	$ 4.35	
Postage	26.80	
Supplies	.65	
Wrappers	2.04	33.84
Excess of Disbursements over Receipts, May 1, 1932 to April 30, 1933		$ 7.89
Add: Deficit, May 1, 1932		3.34
Deficit, April 30, 1933		$ 11.23

(a)—The treasurer received $11.00 of REVIEW money directly

BANK RECONCILIATION AND CASH BALANCE APRIL 30, 1933

Ann Arbor Savings Bank—Commercial Account

Balance per Bank Statement, April 30, 1933	$1,414.65	
Less: Outstanding Check No. 215	3.00	
Balance per Books, April 30, 1933		$1,411.65

Ann Arbor Savings Bank, Savings Account

Balance, May 1, 1932	$ 536.32	
Add: Interest Received	16.23	$ 552.55
Less: Transfer to Commercial Account, Feb. 24, 1933	$ 47.63	
Transfer from Commercial Account, Mar. 31, 1933	47.63	
Balance, April 30, 1933		552.55
Cash Balance, April 30, 1933		$1,964.20

Report of the Secretary for Year 1932-1933

During the year 1932-1933, the twelfth year of business for the American Physiotherapy Association, the Executive Committee held eight business meetings, four regular meetings and four special meetings.

The regular meetings were held as follows: 1st meeting—Chicago in July; 2nd meeting—Ogden Dunes, Indiana in October; 3rd meeting—Chicago in February; 4th meeting—Chicago in June.

Special meetings were as follows: 1st meeting—Chicago in August; 2nd meeting—Chicago in November; 3rd meeting—Chicago in December; 4th meeting—Ogden Dunes, Indiana, in May.

Membership in the Association has increased slightly during the past year in spite of difficult times. Senior membership, 712; Junior membership, 62; Associate membership, 28; Honorary membership, 9; total membership, 811, which shows an increase of 36 over the 1932 enrollment of 774.

During the year appointments were made as follows:

The Doctors John S. Coulter, D. B. Phemister, Ludvig Hektoen of Chicago, Wallace Cole of St. Paul, and F. J. Gaenslen of Milwaukee were invited to serve as the Advisory Board.

Marien Swezey, Vice-President of the American Physiotherapy Association, as Chairman of Membership Committee.

Emily Griffin of Long Branch, New Jersey as Director of Bureau of Appointments.

Margaret Wallace of Evanston as Chairman of Committee on Publicity, following the resignation of Mrs. Charlotte Morrison Dutton of Cleveland.

Edith Monro of Boston as Chairman of Committee on Revision of Constitution.

Florence Phenix as Chairman of Convention Committee.

Resignation of Helen Kaiser as Chairman of Records Contest Committee was accepted.

Special business transacted was as follows:

Chicago was determined upon as the place of the 1933 convention. It was also determined to hold an Eastern and a Western Sectional Conference in April. Accordingly, Constance Greene of Swampscott, Massachusetts, was appointed as Chairman of Eastern Sectional Conference, and Catharine Worthingham of San Jose, California, as Chairman of Western Sectional Conference.

The Eastern Conference was later indefinitely postponed and a full report of the Western Conference is to be found in the report of the Chairman, Catharine Worthingham.

A special meeting with Chairman of Committee on Education was held in August, who gave report of work in progress, but no definite action was taken on the approval of schools at this time. At later meetings, however, seven graduate courses in Physical Therapy and four undergraduate courses were approved for the years 1932 and 1933. Two schools were dropped from the list as formerly approved by the American Physiotherapy Association. (Complete report in that of Chairman of Committee on Education.)

At a meeting with the Advisory Board, along with Chairman of Committee on Education in February, schools and courses in Physical Therapy were discussed and considered, as was examination for membership in our organization versus classification of membership, and some phases of a proposed law on physiotherapy.

The problems presented in a proposed Model Law for physiotherapists, referred to Executive Committee by the Committee on Legislation, and the revision of the Constitution referred by Revisions Committee were thoroughly discussed and considered.

A plan for the examination to qualify for membership in the American Physiotherapy Association was discussed and referred to the Committee on Education.

The Treasurer was authorized to buy and sell American Physiotherapy Association emblems and pins, when Filene's asked to be relieved of such sales.

REVIEW publishing contracts were considered, and the publishing contract with Kable Bros. renewed for one year, at a much lower figure. Also the publishing of a supplement to the REVIEW, a plan suggested by the Editor, was considered. The plan is to publish all business reports and editorials addressed to our members only in such a supplement. After investigation at a later date, the committee considers this a plan well worth trying as soon as finances permit.

Early in year 1933, the Committee agreed to proclaim a moratorium on dues for year of 1932-33, for those members of the organization who were unemployed and applied for the extensions of time to pay dues. The REVIEW, however, was not to be sent to such members who had been granted the extension of time.

At the special May meeting the Executive Committee made appropriations for cost of the American Physiotherapy Association booth at the American Medical Association exhibit in Milwaukee. We believe this kind of work to be most valuable for publicity purposes.

A report also was made of the action taken by the organization protesting the impairment of service in army hospitals by the removal on July 1st of all physiotherapy aides.

A few days later an appeal was made to Senator J. H. Lewis of Illinois to do what he personally could and to advise us how to proceed in the matter. At the same time a letter was written to Surgeon-General Patterson.

The senator referred us to the Medical Corps, and the state of affairs after getting all information in hand, seemed to be that because of the recent measure withdrawing many of the Veteran patients from Army hospitals, it was necessary, but regrettable, to withdraw civilian employees, including the physiotherapy aides; that the Surgeon-General's department considers physiotherapy very valuable and that every effort was being made to retain as many aides as possible. However, sufficient funds had not been appropriated for the service and if not made available it was impossible to include physiotherapy aides on Medical Department rolls.

In view of the fact that our efforts seemed to be futile, because of the economy measure which has already been under consideration by Congress, the matter was allowed to rest, until such time when it appears that some new action might hold forth the hope of an appropriation.

At our last regular meeting the resignation of the present secretary, L. M. Beckman, to become effective at the close of present convention, was accepted, and the appointment of Mrs. Bess Searls of Chicago to complete the term, was made.

During this year's work in office several things have forced themselves upon our attention whereby the work of the organization could be improved and expedited.

The organization receives all sorts of requests for information from State Medical Departments, physicians, and members of our own organization regarding all manner of things.

To illustrate, let me cite a few examples of the type of information asked for:

History of the American Physiotherapy Association.

Number of physiotherapists in U. S.

Number of physiotherapists who have had nurses training as a background in comparison with those who have a physical education background.

Number of hospitals employing physiotherapists.

Question of range of salaries for physiotherapists.

Standing of Physiotherapy Schools not on our list.

Could we secure information as to prerequisites for admittance to certain non-approved physiotherapy schools, and what these schools offer in their courses.

Questions regarding physiotherapy equipment.

Questions regarding planning of schools for handicapped.

Questions regarding books on physiotherapy and other physiotherapy literature.

An effort was made in all cases to give information asked for, but as this information is not to be found in our files and is not readily accessible, it adds considerable work to that of the regular office, and yet, as stated in our constitution, one of our aims is to provide information. Provision was made in our constitution years ago "to provide a bureau of information which will be available to members of the medical profession and the general public as well as to the members of the Association."

This provision, however, was never put into effect. Since, however, our organization has grown to its present size and to its present position of importance, I recommend that Article II, section d regarding the purpose of the Association be made effective.

The collection of all kinds of information regarding physiotherapy is not the work of an hour, of course, but a beginning could well be made and various kinds of information will soon be collected in the files of someone or some committee appointed as provided for.

Another handicap in the work is as follows: The material in the files of the secretary is just an accumulation of material from the beginning, and though filed in some order, yet the organization is amateurish and at times makes the work somewhat laborious. One of the difficulties encountered very often is the lack of cross-filing. For example, one might expect to find facts regarding a certain matter in folder under one of the accredited schools, but perhaps in the same communication there was mentioned a matter in relation to the work of the Committee on Education and thus it would be filed in the folder. Sometimes a search through several folders is required before the sought for material is located.

Therefore, secondly, I make the recommendation that as soon as the organization is financially able that the services of a filing specialist be secured to have the files properly organized and to have important matters cross-filed, and irrelevant matter discarded.

The suggestion also has been made that a synopsis of proceedings of the organization be made available, which could be added to as time goes on and would save an enormous amount of time in looking through minutes of past years or reading through much correspondence to learn the facts wanted. For detailed information one could refer back to minutes or files. The synopsis would be made according to topics. To illustrate:

Heading—Bureau of Appointments.

Sub-topics—Establishment of the Bureau. Recommendations of Executive Committee to Bureau at various times. Actions taken at convention in regard to Bureau. Names of successive appointees of Bureau with dates of term of service.

All such action could be given in synopsis form with dates and indexed references to files or proceedings of meetings where details could be found.

It is recommended that Executive Committee start action which will accomplish such a synopsis of proceedings.

Respectfully submitted,

L. M. BECKMAN, Secretary.

Report of the Bureau of Appointments, 1932-1933

To the Executive Committee of the American Physiotherapy Association:

The report of the Bureau of Appointments for the past year is not one of encouragement but will, I hope, bring forth much discussion and suggestion so that the Bureau may be of more real service. Naturally the condition of the country generally has made the requests for Physical Theropy Technicians fall off markedly, while the number of applicants for positions has proportionately increased.

Upon taking over the work of the Bureau last September, letters were sent to each Chapter stressing the task of the Bureau and requesting that a local member be appointed to serve with the National Chairman whose duties would be to search out positions and to keep a file of applicants. Six Chapters responded by appointing local chairmen but there have been very few reports.

Because of the 1932 Constitutional amendment requiring the payment of an annual fee of $1.00 by all applicants to the Bureau, letters were sent to all persons whose names were on the active file asking them to signify their wish to remain active by payment of the fee.

In January a letter containing a form notice was sent to a few Chapters as a test, as printing was expensive, requesting that the notice be sent to their County Medical Societies with an explanatory letter. Since there were no responses to these notices in the form of requests for technicians, no more were mailed.

I feel very strongly that the Bureau should be permanently located in a medical center to which the medical profession and hospitals would naturally turn and therefore strongly urge the acceptance of the new arrangement of the Constitution providing that the Bureau of Appointments be in the hands of the Executive Secretary.

No. of applicants for positions	49
No. of requests for technicians	11
No. of positions filled	3

Respectfully submitted,

EMILY J. GRIFFIN,

Chairman, Bureau of Appointments.

June 11, 1933.

Membership Committee, Annual Report, June, 1933

Madam President:

As chairman of the Membership Committee, I should like to introduce to this Convention and to the Association, eighty-four persons who, since June of last year, have indicated an interest in joining our Association.

I cannot, of course, introduce them individually, so I shall first present the twenty-nine new members, accepted by the Executive Committee during the past year, twenty to senior membership, eight to junior, and one as an associate member. Next, will you renew your acquaintance with ten former junior members who have completed their requirements as such and been admitted to senior membership? Those of the next group, numbering thirty-six, are still under consideration by the Executive Committee, while nine more have been rejected. I think that you will be interested to know that of the thirty-six applications not yet complete or still under consideration, eight are from members of graduating classes from schools of Physical Therapy recognized by the Association. This has been gratifying because apparantly these schools are setting forth to their graduating classes the advantages of membership in the American Physiotherapy Association.

Perhaps it may seem to some from these figures that we are admitting to membership too large a percentage of applicants, and to others too small a percentage. Let me explain that it takes much more correspondence to reject than to accept an applicant. Many of the thirty-six applications in the open file are from persons obviously ineligible. But it sometimes requires many letters to convince the applicant of this. Each applicant whose training does not come up to the requirements set forth in our By-laws must be questioned carefully regarding other training which might be substituted. Then too often come lengthy letters explaining the advantages of an apprenticeship under a good physiotherapist (perhaps one of our own members) over a prescribed course in physical therapy.

This brings up the question as to whether our requirements are too high to promote the best interests of physical therapy and of our Association. This question comes up at each annual convention, and I believe it should. We have already provided for admission by examination, but as yet no examination has been offered. The details of presenting such examinations are now being worked out. Perhaps I am digressing into the field of the Committee on Education, but I should like to suggest that we have discussion at this convention regarding eligibility requirements for such examinations. At least admission by examination will relieve the Executive Committee of many difficult decisions.

I will not go further into detail regarding the routine work of the Membership Committee. Most of the work has been interesting and stimulating. Letters from chairmen of chapter membership committees have been most gratifying, showing a practically unanimous desire on the part of chapters to maintain our standards and to submit to the National Committee questionable applications.

One bit of routine which we have followed in the past seems unnecessary and cumbersome, as the number of our chapters grow. I refer to the sending of rejection slips by each chapter and by the national chairman to each other chapter, to the treasurer, and to the national chairman for every application rejected. I therefore recommend that in place of this system we adopt the following procedure:

Upon rejection of an applicant by a chapter, it shall be the duty of the Chairman of the Chapter Membership Committee to mail to the Chairman of the National Membership Committee this information.

No chapter shall accept a new member without first ascertaining from the Chairman of the National Membership Committee whether the applicant has ever been rejected by a chapter or by the National Executive Committee.

No applicant so rejected may be accepted for membership by any chapter without the approval of the National Executive Committee.

This procedure, if adopted, shall be incorporated in all chapter Constitutions or By-laws.

Respectfully submitted,

MARIEN SWEZEY, Chairman, Membership Committee.

Report of the Committee on Education for the Year 1932-1933

The Committee on Education has during the past year endeavored to make as complete a study of schools and courses as is possible from submitted curricula and data.

The form of the application blank was changed in order to get more information. The required curriculum was omitted and sent only on request. The schools have, for the most part, cooperated in every way in not only maintaining, but raising our standards.

The following schools and courses have to date been approved for 1933-1934:

Graduate Courses:

Children's Hospital, Los Angeles, California.

Harvard Medical School, Course 445, Boston Massachusetts.

Northwestern Medical School, Chicago, Ill.

Walter Reed Hospital, Washington, D. C.

William & Mary College (Extension Division, Richmond, Va.)

Washington School of Physical Education, Washington, D. C.

The Hospital for the Ruptured and Crippled, N. Y. C.

Undergraduate Courses:

1. Bouve-Boston School of Physical Education, Boston, Mass.
2. Posse Nissen School of Physical Education, Boston, Mass.
3. Sargent School of Physical Education, Boston University, Cambridge, Mass.
4. University of Wisconsin, Madison, Wisconsin.

We are glad to announce that Temple University of Philadelphia, Pa., with Dr. Frank Krusen, Director, has been added to our list.

The following courses are not being offered this next year:

1. Beth Israel Hospital, Newark, N. J.
2. University of Iowa, Iowa City.
3. University of Michigan, Ann Arbor, Michigan.
4. Walter Reed Hospital, Washington, D. C.

No attempt was made to contact foreign schools. We felt the domestic situation which took all our time to be of prime importance. We were, however, very fortunate in having two of our members visiting and studying in England: Miss Jessie Coman of Chicago and Miss Alice Lou Plastridge of Warm Springs, Ga.

A short outline of our high school, physical education, nursing and physiotherapy requirements was prepared for Miss Templeton of the Chartered Society. We believe that the informal meeting and discussion was of value to both societies.

In the revised constitution, now under consideration, a provision for an examination for membership to be given by the Committee on Education has been made.

The Committee on Education has no plan to present at this time. We will act upon the suggestion of the Executive Committee in seeking advice from schools and members.

We also hope that soon we may have more adequate inspection of our schools and courses, as the present method is proving inadequate.

I wish to thank all the chapter representatives for their help during the year. It is only through the chapters that we can keep in close touch with the local problems which soon become national ones.

We earnestly request that the chapters report to us any and all criticism pertaining to education. We also would like the names of any institution giving courses in Physical Therapy in their State.

The list of approved schools and a copy of our minimum requirements will be sent to the chairman of the chapter committee on education. To save correspondence, other committees in the chapter may obtain the information from her.

Massachusetts had a splendid program of study and lectures.

Pennsylvania has been very active in placing the aims and standards of their association before Hospitals, State Boards of Medical Education and Licensure and Medical Societies. They report that they feel they have made a decided step toward cooperation with the above.

The chairman of the Michigan Chapter sent us copies of letters from hospitals and physicians in response to a letter from her asking whether or not they offered a course in physical therapy. This information is much appreciated.

Other chapters have had no definite program, and some chapter reports have not yet been received.

We are looking forward to 1933-1934 as a year of promise. Let us all work to keep our ideals and standards high, so that our future members will be proud of the foundations laid by us.

Respectfully submitted,

MILDRED ELSON, Chairman, Committee on Education.

Report of the Publicity Committee

The work of the Publicity Committee was interrupted in the winter by the resignation of its chairman, Miss Charlotte Morrison. The present chairman has tried to carry on with more or less success.

A survey of the various chapters shows that the trend of the publicity for the past year has been toward the newspaper announcements of the chapter meetings and write-ups of their programs.

The biggest thing the National Publicity Committee attempted was an exhibit of the association at the A. M. A. convention in Milwaukee. They were kind enough to give us a booth where we had a poster exhibit showing the standards of our association and the scope of its work. We also had a motion picture showing the Principles of Massage Technic. And at this point I wish to express my appreciation to Miss Mildred Elson for her excellent photography and to Miss Gertrude Beard for her kind assistance and cooperation.

Respectfully submitted,

MARGARET A. WALLACE, Chairman of National Publicity.

Report of the National Legislative Committee, 1932-1933

Early in November a letter was sent out to all chapters requesting each legislative chairman to concentrate on the first two duties of the Legislative Committee as laid down in our Constitution, Article VII, Section 1 of our By-Laws.

Nine of our seventeen chapters have been heard from during the year.

California. A law had been introduced into the California Legislature which would permit only chiropractors to use electrotherapy apparatus. The State Medical Society requested a formal protest by the state chapter. No further report has been received.

Minnesota. This chapter requested suggestions for legislation in their endeavor to make a legislative effort.

No report of progress has been received.

New Jersey. The legislative chairman presented suggestions for legislation similar to those drawn up at our National Convention last June.

New York. Correspondence with the State Medical Society substantiates the fact that this is not an opportune time to attempt an amendment to the Medical Practice Act.

Ohio. The Cleveland Chapter requested the newest developments in legislative activity.

Oregon. This chapter sent copies of their recently passed Basic Science Bill, the requirements and laws governing nursing, the laws governing the practice of naturopathy.

Texas. This chapter reports no laws governing physical therapy and sent a copy of the state laws governing nursing.

Washington, D. C. This chapter sent a copy of their laws governing nursing. No legislative activity is reported, but this chapter feels that registration is the desirable solution.

Washington. This chapter reports no laws governing physical therapy. The nearest classification is with beauty parlor specialists or drugless physicians. This group feels that within this state it is wisest to work quietly and ethically in conjunction with the medical profession.

Chapters not heard from: Chicago, Massachusetts, Michigan, Pennsylvania, Rhode Island, Southern California, Western New York, Wisconsin.

Respectfully submitted,
MARY ELIZABETH HIBBLER, National Legislative Chr.

Report of Editor of The Physiotherapy Review

Madam President:

During the fiscal year of 1932-1933 the PHYSIOTHERAPY REVIEW has carried on as usual. Its mailing list shows an interesting breadth of circulation. We have followed our usual custom of alloting an issue to a group of chapters as its particular number of articles, case reports and chapter activities and problems. It is as the official organ of this Association that the REVIEW was inaugurated and as such it must remain with freedom for its contributors and committee reports.

Due to efforts to curtail expenses the REVIEW has not been able to pay the additional costs of illustrations to articles, valuable though they are. At this time I want to express for the Association and the REVIEW the very hearty thanks due the individuals and Chapters who have made possible the illustrations which have appeared. Likewise our appreciation goes to Miss Beard, Miss Hazenhyer and Doctor Coulter. It is due to Miss Beard's untiring efforts that the business and advertising have risen to their present status. You will hear her report with interest.

Respectfully submitted,
DOROTHEA M. BECK, Editor.

June 13, 1933.

Chapter Reports

CHICAGO CHAPTER

To the Officers and Members of the American Physiotherapy Association:

During the year ending June, 1933, the Chicago Chapter of the American Physiotherapy Association held five regular chapter meetings and five executive committee meetings. There were four applicants admitted into membership of the chapter.

Our program for the year's meetings included the following:

Miss Mabel Smart, of the Spalding School Faculty told of the work there with cerebral palsy.

Dr. Edward Compere of Billing's Hospital, Chicago, gave an illustrated lecture on Scoliosis and Pott's disease.

Dr. Sumner Koch of the Passavant Hospital, Chicago, and Cook County Hospital in Chicago, spoke on infections of the hand.

Dr. Frederick H. Moorehead, a member of the staff of Presbyterian Hospital and Children's Memorial Hospital of Chicago, gave a lecture on plastic surgery, cleft palate and harelip, illustrated by lantern slides.

One meeting was held at the Good Will Industries, an institution which employs handicapped adults.

Respectfully submitted,
VIOLA K. SCHNEBERGER, President.

CLEVELAND CHAPTER, JUNE 1, 1932—JUNE 1, 1933

At our first meeting in September, 1932, we were given copies of our Constitution and By-laws which had been carefully revised. They were unanimously accepted. Six committees were appointed: Legislative, Publishing, Education, Lectures and Entertainment, and Registration. Chairmen and members were appointed. These committees worked very well during the year and the annual reports are as follows:

1. PUBLISHING (Miss Green, Chairman). Two papers were published in the January-February issue of this year's Physiotherapy Review; one on "Considerations in the Treatment of Periarthritis of the Shoulder" by Dr. James A. Dickson, Cleveland Clinic, and the other, "The Walk-Aider," by Margaret W. Cleaveland. The National Carbon Co. continued their advertisement in this year's Review.

2. LECTURES AND ENTERTAINMENT (Miss Koch, Chairman). Three lectures were given by physicians during the winter. The first was by Dr. Duncan, on Dec. 15, 1932, at the Cleveland Clinic, Subject: "Arthritis". The second lecture was given by Dr. Stout at the City Hospital on Jan. 16, 1933, on "Movements in Diseases of the Brain and Spinal Cord", and the third by Dr. Heyman at Lakeside Hospital on Feb. 13, 1933, on "Joint Adhesions."

The annual business meeting and picnic supper was held on June 12th, 1933, at Mrs. Taylor's farm.

3. REGISTRATION AND APPOINTMENT (Miss Kylin, Chairman). The first meeting of this committee was held last fall in response to a letter from Miss Emily J. Griffin, Chairman of the National Committee on Appointments. We were asked to cooperate in finding positions and also to list members seeking positions. As no vacant positions have come to our knowledge and as we have no applicants, we have not been able to render Miss Griffin any service of value.

How to bring the practicing physician in Cleveland into touch with the physiotherapist has been the main work of this committee. Through the help of the Executive Secretary of the Academy of Medicine, a notice of a Call Bureau for Physiotherapists, who are associate members of the Academy, was put in the Bulletin of the Academy. That is to be followed by cards to be sent to all physicians who are active members of the Association stating that physiotherapists will be registered at the office of the Academy. We feel that this is a definite step in the right direction.

4. LEGISLATIVE (Mr. Anliot, Chairman).
5. EDUCATION (Miss Kaiser, Chairman).

Four new members were taken in during the year and one transfer from the Chicago chapter, making our number of members, twenty-four.

There were four regular meetings held during the past year.

ALICE E. KINGMAN, Corresponding Secretary.

DISTRICT OF COLUMBIA CHAPTER, 1932-1933

Monthly meetings were held the first Tuesday of the month in the offices of Dr. Talbot, 1835 Eye Street.

The following program of talks was arranged by Miss Mary Lee Castleman, Chairman, Program Committee:

October—Dr. Helen Kain, "Activities of District of Columbia Charity Board.

November—Dr. Daniel Borden, Motion Picture, "Hernia, Causes and Treatment.

December—Dr. Hunter, "Physiology of Immunization."

January—Dr. Breeding, "Ear, Nose and Throat Conditions."

February—Dr. A. B. Moors, "Roentgenology."

March—Dr. James A. Lyon, "Physiotherapy in Cardiac Conditions."

April—Dr. Teischman, "Treatment of Skin Conditions."

May—Dr. Grafton Tyler, "Allergy."

There are nineteen members on the roll call.

EMMA E. VOGEL, Secretary Treasurer.

MASSACHUSETTS PHYSIOTHERAPY ASSOCIATION, INC., 1932-1933

Greetings, everyone! Massachusetts members are keenly interested in the Convention and wish more were able to attend. Nevertheless we have our very capable co-worker and splendid backer here to read our report and give you our best wishes for a grand Convention.

During the past year regular lectures were given at our monthly meetings. Such topics as fractures, glands, heart, and electro-magnetic spectrum were discussed. Three courses offered to the members were "Electrotherapy"—consisting of theory and practical hours. A very good review for some and an excellent course for the beginner. "Orthopedic"—a group of lectures describing in detail operations and their procedures and also the new ideas in this field. It was a great privilege for a small group of our members to participate in a "Dissection" course. Detailed yet informal classes were held. The many perplexing questions concerning body mechanics, muscle action and location, nerves and all the innumerable questions a physiotherapist can ask were answered. (Which incidentally were not few and far between nor simple to answer.)

Seven new members joined the chapter. Our total membership is now seventy-three.

Our busy and progressive year ended with a most colorful travel talk. All left the annual meeting with expectations for a busy and instructive year to follow.

Respectfully submitted,

DOROTHY FREDRICKSON, Secretary.

MICHIGAN CHAPTER REPORT, 1932-1933

The Michigan Chapter roll now includes thirty-seven members, fifteen in Detroit and the remainder scattered throughout the state.

Four meetings were held throughout the year, three in Detroit and one in Ann Arbor. The November meeting was devoted to reports of retiring officers and the election of officers for the ensuing two years.

The second meeting was in Children's Hospital, with an address by Dr. Rachel Stutzman of the Merrill Palmer School on the Psychology of the Crippled Child. Dr. Price talked on experimental work with Arthritis as conducted at the Harper Hospital clinic at the next meeting, at Harper Hospital. Notices were sent out in March for a dinner meeting with an illustrated talk by Dr. Kidner, but due to the closing of the banks and the subsequent confusion, it seemed better to postpone this meeting till fall. The final meeting was held in Ann Arbor in May, with a cafeteria supper in the Woman's League Building, followed by an address by Dr. Williams of the University Hospital on Painful Low Back Conditions.

We feel that the year has been a very successful one in spite of unsettled financial conditions. Most, if not all, of our members have retained their positions, though with drastic salary cuts, and have retained an undiminished enthusiasm for their profession and the Association.

EMILY ADAMS, Secretary.

MINNESOTA CHAPTER REPORT FOR 1932-1933

The Minnesota Chapter of the American Physiotherapy Assn. held monthly meetings alternating between St. Paul and Minneapolis with one meeting in Rochester.

At the first meeting in November committee chairmen were appointed and the educational program for the year discussed. We decided to study Anatomy and Kinesiology with different members leading the discussions. We established a circulating library and each member was asked to give a list of books in her possession.

The discussion on the shoulder and arm with especial emphasis on the Brachial Plexus was led by Mrs. Brown at the December meeting.

This was followed in January by the demonstration of the treatment of Erbs Palsy and Ischemic Paralysis by electrical stimulation and muscle training.

We had a dinner meeting in February at which we heard a talk on The Economic Situation in Medicine by Dr. N. O. Pearce who is President of the Minnesota State Medical Assn. and President of the Tuberculosis Assn. of Minnesota. He also discussed Legislative matters with us. At this time the revised constitution was read and discussed.

After Miss Hindman and Miss Foss opened the Physiotherapy Center at the Lowry Medical Arts Building in St. Paul we were informed unofficially by the attorney for the Minnesota Medical Assn. that there was a question as to whether or not the office might be established. His opinion was that no Physiotherapist in Minnesota was within the law unless he or she was licensed.

At Gillette State Hospital in March Miss Denny and Miss Smith demonstrated muscle re-education on post-operative cases such as were described by Dr. Lowman of Los Angeles in the article "The Relation of the Abdominal Muscles to Paralytic Scoliosis." The operations on the cases presented consisted of fascial transplants for plastic repair of the abdominal wall.

Miss Hindman led a discussion on the nerve supply to the lower extremity at the April meeting.

The May meeting was held in Rochester. We voted to accept the revised constitution and Miss Baethke was elected to be the voting delegate to the convention. Three Mayo clinic doctors talked at this meeting, Dr. H. W. Myerding from the Orthopedic section spoke on "Ischemic Paralysis", Dr. A. L. Clark, section of Special Urology, spoke on "Ultra Violet Rays to the Inner Surface of the Bladder" and Dr. Leda Stacy, General Medical Diagnosis, spoke on "Elliot Treatments." Some slides were shown on "Weak Feet."

The June meeting was a picnic meeting.

Respectfully submitted,
GEORGIA MAY SCHORI, Secretary.

ANNUAL REPORT OF NEW JERSEY CHAPTER

The New Jersey Chapter held its meeting this year with the New York Chapter, alternating one month in New York City and the next month in Newark, New Jersey. The programs were all given by doctors followed by a discussion and the following topics were included: Public School Orthopedics, Dermatology, Gynecology, Nervous Disorders, Peripheral Nerve Injuries, and Pool Work for Infantile Paralysis.

The membership is slowly increasing although attendance has been poor. We believe this is partly due to a loss of interest on the part of some who have not been able to find physiotherapy positions, and partly to economic conditions.

The New Jersey Chapter has wanted a library for its members and we have made a small start by giving a succession of bridge parties at members' homes. There is no expense in giving the party and $.50 admission has been asked. The chapter intends to add to the library fund in this way until it can furnish a useful list of books, especially new books on Physiotherapy, which are not available in other libraries.

Respectfully submitted,
(Mrs. F. Ross Kelland)
MARY L. KELLAND, Secretary.

ANNUAL REPORT OF THE NEW YORK CHAPTER

The meetings of the New York and New Jersey Chapters were again this year held alternately. Five meetings in New York and four in New Jersey.

The first meeting, a social one, was held at Schrafts in New York City, the Advisory Councils of both chapters were guests at dinner.

Lectures during the year:

December, Dr. Ney spoke and demonstrated by lantern slides a lecture on "Peripheral Nerve Injuries." Dr. Richard Kovacs—"Electro Diagnosis."

February—Dr. Walter Klingman on "Physical Therapy in Nervous Diseases."

April—Dr. Falk spoke on Physical Therapy in Gynecology.

May—Miss Barbara White of London, England, "Interpretation of Margaret Morris Movement and Its Relation to Remedial Exercise."

Executive monthly meetings were held at the homes of members.

Business during the year.—Besides the general business for the year, eight members were accepted, two rejected and one transferred. At the October meeting the New York and New Jersey Chapters decided to invite the Eastern Section of the American Physiotherapy Assn. to hold their Sectional meeting in New York, March 29-31, 1933. A Committee was formed and plans for the meeting were made but due to the banking situation at that time the meeting was cancelled. At the October meeting it was suggested that the Chapter have a circulating library and thirty dollars per year be spent to purchase Physiotherapy books.

The meetings were well attended and the lectures and demonstrations were most interesting and instructive.

Respectfully submitted,
ANN MARJEY, Secretary.

NORTHERN CALIFORNIA CHAPTER, ANNUAL REPORT FOR 1932-1933

During the past year this chapter has held five meetings which were well attended by members, doctors and friends. Many expressions of mutual interest and cooperation have resulted from the contacts of these meetings.

The program for the year follows:

1. October 11, 1932. Dr. S. L. Haas, of Shriner's Hospital, spoke to the group on "Poliomyelitis."

2. It came to the attention of our Chapter that the Northern and Southern California Orthopedic Clubs were having a meeting in San Francisco on November 12th. Our chapter consequently arranged a meeting for November 11th, and asked certain members from each club to speak. The meeting was a dinner meeting. Over sixty attended. Dr. H. E. Markel acted as toastmaster. Dr. H. W. Spiers spoke on "The Problem of the Physically Handicapped Child." Dr. LeRoy Abbott presented a paper "Remarks on the Motions of the Shoulder Joint," which was read by Dr. F. Linde, due to Dr. Abbott's illness. Dr. C. L. Lowman presented "Some Observations on the Kinetics of Paralytic Scoliosis," accompanied by a most instructive and interesting movie.

3. Dr. F. G. Linde spoke on "The Anatomy and Use of the Foot," giving illustrations of various foot conditions.

4. Dr. Joseph Catton, noted alienist, spoke on "Psychiatry and Its Relation to Physiotherapy." In his discussion he brought out points from several well known cases, among them the Ruth Judd case.

5. On April 28th and 29th, our Chapter was entertained by the Southern California Chapter at the Western Regional Conference. We are grateful to them for a thrilling meeting and for their most generous hospitality.

6. Dr. J. J. Loutzenheiser spoke on "The Action and Physiology of Muscles." Dr. J. T. Watkins led a most interesting discussion of his paper. Miss Hazel Furscott gave a report of the "Western Regional Conference."

7. On April 23rd the Northern California Chapter was the guest of the Western Division of "The American Congress of Physical Therapy," held at Hotel Del Monte, just previous to the California State Medical Association Meeting.

This year the Chapter has started a library. About a dozen volumes dealing with physiotherapy and allied subjects have been purchased. These are rented to members at a nominal fee, the money being used for purchasing additional volumes.

The Chapter has thought it advisable to keep in close touch with the educational institutions of this region and has invited those responsible for the health and physical education work to certain meetings.

The "Physiotherapy Review" has been sent to the County Medical Associations of Alameda, Santa Clara and San Francisco.

An extremely interesting survey of physiotherapy by the San Francisco Medical Society is now in progress.

The Northern California Chapter sends its best wishes to the American Physiotherapy Association in Convention at Chicago. Yours for a great convention.

Respectfully submitted,
CATHERINE WORTHINGHAM, President.
ELIZABETH HOBBIE, Secretary.

REPORT OF OREGON CHAPTER

Oregon is unable to have a delegate at the convention this year, and there is very little to report by letter.

Because of existing conditions our active, paid up members, number but five to date. Many of the members are without positions and while interested in the chapter can not pay dues at present.

We have had three or four informal meetings in the homes of members, being entertained at dinner in two homes and for a delightful week end at another member's beach cottage. Discussions and problems were the topics on these occasions. Correspondence read and replies advised.

Best wishes for all the members in Convention and for the whole Association in the future.

Sorry we can not be with you.

Sincerely,
MIRIAM R. EWING, President.

REPORT OF WASHINGTON CHAPTER

During the year 1932-33, the Washington Chapter held nine meetings; one business, four social and four lectures. The June meeting was a picnic at American Lake. Doctors who had given lectures and others who had entertained us, were our guests.

We are sorry to have no delegate this year.

CORNELIA NEWMAN, Secretary.

PENNSYLVANIA PHYSIOTHERAPY ASSOCIATION, ANNUAL REPORT, 1933

A report of the secretary of the Pennsylvania Physiotherapy Association, Inc., for the fiscal year ending June, 1933, is herewith presented as follows:

Seven meetings of the Board of Directors held at the homes of the directors—

Nine regular monthly business meetings—seven of which were held in the lecture rooms of the Graduate Hospital of the University of Pennsylvania—two at the Institute of the Pennsylvania Hospital—

One special meeting held at the Philadelphia County Medical Society Building.

The following medical men lectured to us on subjects of constructive interest in the field of Physiotherapy: Drs. Frank H. Krusen, Joseph C. Yaskin, Maurice Weisblum, Richard W. Larer, Nicholas Gotten, Joseph W. Post, John A. Brooke, Joseph Edereiken.

At the April meeting after the regular business was transacted, the meeting was turned over to two of our own members, Mr. Holmes who gave a short talk on "Hydrotherapy" and Mr. Campbell, who demonstrated the technique of the "Wet Pack."

A special meeting was held in September to determine the attitude of our members toward offering their services and co-operation to the physicians in the after-care of patients of the Infantile Paralysis Epidemic, with the result, a resolution was made that "The Pennsylvania Physiotherapy Ass'n offer their services to the proper authorities in this epidemic of Infantile Paralysis."

A committee of three was appointed, the chairman giving monthly reports of the work done. The volunteer workers being re-imbursed for their car-fare from the funds of our treasury.

A Christmas donation of One Hundred Dollars ($100.00) from our Association was made to the Emergency Aid of Philadelphia for braces for needy cases of Infantile Paralysis for which we receive a letter of thanks from the chairman, Mrs. Robert C. Wright.

Respectfully submitted,
LOUISE JETTER, Secretary.

REPORT OF SOUTHERN CALIFORNIA CHAPTER, 1932-1933

The Southern California Chapter of the American Physiotherapy Association has just ended a very satisfactory year. Our membership includes fifty-seven active members, two of last year's members having dropped and two new members having been added to the roll. Four additional new members have been accepted for the year 1933-1934.

We met every second month beginning with October, 1932, and ending with June, 1933, five meetings in all, including the Western Regional Meeting in April. We had seven Executive Committee meetings during the year. Our meetings have been dinner meetings with a good speaker at each meeting. Our average attendance has been thirty-seven (including the Regional Meeting).

The following is a list of our speakers for the year and their subjects:

October, Dr. C. L. Lowman, "Relation of Body Mechanics to Physiotherapy."

December, Dr. S. S. Matthews, "Treatment of Fractures."

February, Dr. J. J. Haggarty, "Hyperexia."

April, Western Regional Meeting.

June, Dr. C. A. Wright, "Endocrinology."

The Regional Meeting which was held in April in Los Angeles is being reported by Miss Catherine Worthingham, Chairman, Western Section Convention.

JEFFERSON I. BROWN,
President, Southern California Chapter.

REPORT OF THE TEXAS CHAPTER FOR 1932-1933

Number of meetings, 9. Average attendance, 4. Members, 6 Senior, 2 Junior.

ACTIVITIES

In November, 1932, we gave a program demonstration to the women medical students of Baylor University Medical School, and to women physicians and friends, all members participating in showing the various phases of physiotherapy including—massage, muscle training and testing, underwater gymnastics, posture, scoliosis and electrical therapy. A visit was made to the Occupational Therapy department which is maintained by the Junior League of Dallas in connection with the Scottish Rite Hospital for Crippled Children.

Starting in January we had a series of talks by three different doctors on the relationship of Physiotherapy to the treatment of fractures, abnormal menstruation, and nervous diseases. These meetings proved most instructive, being followed by an active discussion by all present. On these occasions we frequently invite nurses, medical students, or others whose occupation is related to our profession.

The May meeting ended the year with a picnic and farewell party for our retiring president who has just graduated in medicine.

Respectfully submitted,
WINIFRED G. MOORE, Acting Secretary.

WESTERN NEW YORK CHAPTER

"Greetings" from the Western New York Chapter to The 12th Annual Convention of the American Physiotherapy Association:

During the past year, our Chapter has had fewer meetings than usual, but, nevertheless, some very interesting ones.

Three program-dinner meetings have been held. In October, at Niagara Falls, Dr. Ardan, a pioneer in the physical therapy field, spoke on "Physiotherapy in General Practice." In December, at Buffalo, Dr. Martin, Director of Physical Therapy and Assistant Medical Superintendent of the Buffalo City Hospital, gave an address on "Light Therapy," a phase of Physical Therapy in which he is doing a great deal of clinical research. Our third meeting, in April, was held at Rochester. At this time Dr. C. T. Harris spoke on the work in the

Crippled Children's Schools of Rochester, (of which he is director) and discussed work with handicapped children in general.

This meeting was also our Annual Meeting at which time all annual reports were given and election of officers took place.

We are happy to report that in the past year to our membership have been added five active members and one associate member, making our total 18 active and 11 associate members.

We feel we are slowly but surely developing recognition among the Medical profession and helping to raise the professional standards of Physical Therapy.

Success and best wishes to the Convention.

Respectfully submitted,
E. POLLY PERKINS, President.

WISCONSIN CHAPTER

The Wisconsin Chapter has been flourishing with a very quiet year due to our National Convention of 1932.

Social activities, such as dinners, bridges, teas, etc., have been planned by our program committee to stimulate morale during these depressing times.

The Wisconsin Chapter News has been continuing its activities and furnishing professional, educational, and social reparté to our homogeneous group throughout our large state.

At one of our meetings, Dr. Helen Denniston of the Wisconsin State University outlined the U. of Wis. course in Physiotherapy, which made the Chapter very proud that such splendid cooperation continues with our local university.

The Chapter has felt very keenly the importance of our educational standards and the power of our constitution and by-laws. We therefore voted to study our constitution and by-laws very thoroughly with the view to making them more expressive and effective, and thus of more assistance to us and to the National Association. Three "able-bodied" members have been appointed to carry out this enterprise, and to report to the Chapter with their deliberations.

The local Chapter is cooperating with the National Association for the success of the first American Physiotherapy Association exhibit to be presented at an American Medical Association Convention to be held here from June 12 to June 16.

Some of our members have been cooperating with local physicians and agencies in preparing material for the proper education of the lay public in Physiotherapy.

We Wisconsin Chapterists, although constituting but a small group numerically, are demonstrating that "where two or three are gathered together" in the name of Physiotherapy, the results of conscientious personal application together with eternal vigilance, will benefit not only the patients treated, but, thanks to the efficiency of our National Association officials, will benefit other small, young Chapterites as well.

LUCY E. BLAIR, President;
GOLDIE GREAR, Secretary.

Report of Western Regional Meeting at Orthopaedic Hospital-School, of Los Angeles, California

On Friday, April 28, registration for the Regional Meeting of the American Physiotherapy Association started a little before 9 A. M. at the Orthopaedic Hospital-School. Our past president, Miss Lucille Grunewald, took charge of registration in Memorial Hall.

At 9:30 work in the Outside Pool of the Under-water Gymnasium started with a demonstration of triple team work for long standing poliomyelitis cases with varying degree of paralysis of the legs and trunk. This was to illustrate handling patients in groups and the psychological advantage of group activity.

Next was a case of vertebral epiphysitis emphasizing general body activity without weight or gravity pull on the spine.

This was followed by a case of Stills disease with exercises to increase joint range, coordination and endurance.

Fourth—An old poliomyelitis case, a child too young for spinal fusion being held by an abdominal fascial transplant.

Fifth—A case of congenital multiple arthrogryposis. These cases were explained by Miss Aust as well as a case of cerebral spastic quadriplegia which was demonstrated in the Hot Pool—100° F.

Miss Bernhard demonstrated in the Indoor Pool a long standing poliomyelitis case with a recent spinal fusion; this was to show activity possible while wearing a back brace designed for water.

Second—A case of cerebellar ataxia and the value of water exercises for coordination.

Third—Circumflex paralysis with transplant of upper portion of trapezius to the humerus.

Fourth—An old poliomyelitis case with an Ober operation to the hip.

Fifth—A more recent poliomyelitis case with double arm and hand paralysis.

Sixth—A recent poliomyelitis case with an abdominal transplant to illustrate possible advantage of early trunk fixation when there is extensive leg paralysis with the lower rectus abdominus also badly involved and stretch paralysis everted through the transplant, while making early treatment in the pool possible.

Mrs. Martin demonstrated the advantage of warm salt water on drainage cases—showing two cases of osteomyelitis.

At eleven we adjourned to Memorial Auditorium to hear Dr. Robert Carroll demonstrate the turn buckle jacket for scoliosis with X-rays, photos and with a child in a jacket.

Dr. C. L. Lowman followed, speaking on equilibration with special regard to types of feet.

Lunch was served to fifty with Dr. Lowman and Dr. Carroll as guests of the chapter while Miss Mildred Riese, Superintendent of the Orthopaedic Hospital-School and Miss Charlotte Field, Director of the Out-Patient Department, were Miss Sue Roen's guests as well as Miss Germaine Guiot, head of the Physical Education Department for women, and Dr. V. Blanche Slagerman, Medical Advisor to women of the University of Southern California. Miss Jefferson Brown, our local chapter president, made a brief speech of welcome and introduced Miss Catherine Worthingham, president of the Northern California Chapter and Chairman of the Regional Meeting, who in turn introduced all the out of town members. There were no speeches as we had two more Clinics to visit immediately following.

SUSAN Q. ROEN.

REPORT OF CASES

April 28, 1933.

The demonstration at the Los Angeles County General Hospital consisted of the usual variety of cases which a big hospital can offer.

Besides nerve injuries and fractures which were scheduled for that day, there were severed tendons (su-

tured), a post operative cancer of the breast, encephalitis. polioauyelitis, arthritis, medical cases with disorders of the intestinal tract, superficial infections, and Burger's Disease.

The Department itself which is simply a converted ward is not especially well adapted for physiotherapy but by using every inch of space, it takes care of two hundred or more patients a day and must continue to do so until the new hospital is opened.

MARGARET BLAKE.

Announcement

The American Congress of Physical Therapy announces its twelfth annual scientific and clinical session which will be held on September 11 to 15, 1933, at the Palmer House, Chicago.

Each year these annual gatherings have increased in popularity. This is due to the splendid programs which are offered. This year efforts have been doubled to present a program which will appeal to every physician and technician engaged in the application of physical measures. Clinics and addresses deal with a variety of subjects, from the very fundamental to the more advanced. A large number of research reports will be made by prominent leaders in the field.

Physicians are urged to plan their vacations for this September session. The Century of Progress Exposition and this twelfth annual meeting of the Congress will make a week's stay in Chicago profitable and interesting.

As an unusually large attendance is anticipated those who plan to attend should make their hotel reservations as early as possible. Preliminary programs will be mailed on request. Write to the Executive Secretary, American Congress of Physical Therapy, 30 North Michigan Avenue, Chicago.

Westminster Hall, Ithaca, New York, Aug. 2, 1933.

In the March-April issue of the REVIEW, there appeared an article of mine entitled "Speech Problems of the Spastic." The material for that article was gained from my own personal experiences as a youth handicapped by such defects and from extensive reading in this field. One of the finest books on the subject is by Dr. Robert West entitled "Disorders of Speech and Voice." It was one of my sources and I wish to emphasize how valuable a source I consider it and to advise all the readers of the Journal to familiarize themselves with that exhaustive treatise on the subject. I understand that Dr. West is concerned; he thought I drew too heavily upon his material. In this connection, I can only apologize and tell him that I found other references with very much the same material.

W. B. YEAGER, JR.

An advanced course in ORTHOPEDICS is being established by Dr. W. R. MacAusland, Surgeon-in-Chief of the Carney Hospital, Boston, and his associates, to be open to *graduates of recognized schools of Physical Education.* This course will be given first in the fall of 1933, and will be repeated in the spring and in the summer of 1934.

The course consists of a series of lectures on orthopedic lesions, including particularly infantile paralysis; back lesions; arthritis; the common joint injuries, with emphasis on the injury occuring in sports; faulty posture; static lesions of the foot, knee, and hip, and the problem of exercise. Clinical demonstrations of orthopedic material will be given at hospitals. Operative treatment will be discussed and demonstrated.

An opportunity will be given to each student to take an active part in the examination and treatment of the common orthopedic lesions.

In conjunction with the instruction on orthopedics, lectures on medical problems, including dental, nose and throat, and skin lesions, diseases of the heart and kidney, and children's diseases, will be given by leading specialists in their respective fields.

Further information on the course may be obtained by writing to Dr. MacAusland's office, 412 Beacon Street, Boston, Mass.

The Problem of the Spastic*

By Steele F. Stewart, M.D.

The problem of the spastic from the standpoint of treatment is familiar to practically every physiotherapist. A knowledge of the reasons for the spastic phenomena is not diffused and an appreciation of it helps in the understanding of the spastic. The best approach is by the evolutionary pathway, wherein we assume the physical evolution of man.

Nature has made three attempts at the formation of the biped: birds, the kangaroo-like creatures and primates; but in man alone the general axes of the spinal column, thighs and legs lie in the same straight line. It would therefore seem that the EXTENSION OF THE HIP JOINT was a human characteristic and that the so-called extensors of the hip are in reality pelvic erectors. Elephants and man are the only examples of the EXTENDED KNEE, that I recall, and both of these creatures are remarkable for their height. The knee extensors, therefore, might be classed as the elevators of the body. In the apes, closest related to man, both hip and knee extension are incomplete, and these creatures almost habitually are quadrupedal. The birds and man are MOMENTARY MONOPEDS as contrasted with the simultaneous bipedal gait of the kangaroo.

In man the DEVELOPMENT OF THE FACIAL MUSCULATURE is unique and gives to him a variety of expression which is absent from all other animals. Some of the apes facially express pain, anger, pleasure, etc., but in none of them is there the fine play of expression characteristic of man. VOCAL EXPRESSION is also more highly developed in man than in other creatures, being peculiar in the power of rapidly shifting from one sound to another. A child starts with monosyllables, then combines two of the same as da-da

*Read before the Western Regional Conference of the A. P. A., Los Angeles, Calif., April, 1933.

or ma-ma, then they become able to unite two different sounds and finally they handle many syllabled words. The beasts rarely get beyond the first stage, birds on the other hand reach the second stage.

Only in the apes does the INTRICATE USE OF THE HAND compare to that of man.

These characteristics have evolved along with the gradual development of the brain so that the olfactory and optic lobes, which are so prominent in primitive creatures, are overwhelmed by the development of a new mantle of gray matter that forms the cerebrum. The quadrupedal posture is found before the cerebrum and its central mechanism must be resident in the primitive structures. The more complicated bipedal and monopedal postures appear with the development of the cerebrum and probably find representation in the newer brain, as do facial and vocal expression. The fullest development of these phenomena, as they appear in man, are accompanied by the greatest development of the frontal lobes which seem also to be connected with the power of disassociating action and reaction, which we call the POWER OF INHIBITION. Here man is in distinct contrast to that of reptile in which striking appears almost immediately on stimulation. Man, on the other hand, may recombine past experiences into actions which are apparently entirely unassociated with immediate environment.

It is usually believed that the more recently acquired characteristics are most easily lost or waylaid. It would seem, therefore, that any slight cerebral accident in the most formative period of life (the seventh month of gestation through the first few months of post-natal life) might be accompanied by cerebral phenomena out of all proportion to the apparent pathology. The poisoning of newly developed cells by a toxemia prior or subsequent to birth might cause the arrest of these new cerebral cells. Impaired nutrition either by an arterial or venous shut-off would likewise decommission a greater or less proportion of the cerebral mechanism. We would therefore expect to find interference with the mechanism which makes man peculiarly man. There will be a tendency to a reversion to the quadrupedal posture and gait of the apes, and it is in the muscles subserving quadrupedal posture that we find our greatest rigidities in the spastic. We would expect a more mask-like face lacking in the finer forms of expression. We would expect a speech more or less reduced to simple sounds or the repetition of simple sounds. We would expect awkward hands and the exaggeration of reflex phenomena, and impaired intellect and inhibition.

These portions of the brain having been destroyed may never be replaced, and we are faced with the necessity of trying to teach a reversionary creature the tricks essential to competition with a more highly evolved species. In those with lesser cerebral difficulties there will be the training to avoid awkwardness in the use of hands, feet and speech. In those of moderate degree, in addition to the defects we have noted, there will be the necessity for teaching erect posture and more normal gait and the use of the hand as a hand. While in the more severe forms instruction will be well nigh hopeless. In any and all there will be the proneness to return to the basic pattern just as surely as the dog, who is taught to walk on his hind legs, reverts to four when his trick is done.

Los Angeles, Calif.

Physiotherapy with the Spastic Child*

By Lillie Tucker

I think that Physiotherapy and Occupational-therapy may be used together to a very good advantages with the spastic child if Occupational-therapy is used from a curative standpoint and not merely to teach a trade. I think too many people working with spastic cases accept them as being permanently handicapped and so feel that the best thing to do is to teach them a trade or occupation whereby they may become self supporting so that they will not be a burden upon society. Occupational-therapy has often been used to this end instead of as a curative means. Too many people try to fit them to live a more useful life in their present physical condition, and by this attitude on the part of those working with them they are held in this condition instead of being lifted out of it to where they may live a normal life.

I think that we who work with the spastic child have to see him as he will be when he is perfect and not as he is now. We have to have and to hold for him the vision of a perfect body. We have to hold that vision so constantly before his mind, make it so vivid, that finally it becomes *his* vision—a part of his thought life. And when we have succeeded in making him see this vision as we see it, have succeeded in removing from his conscious and sub-conscious mind the impressions that have been registered there from past experiences and associations which have made him feel inferior and helpless, we have made a great step forward.

You may think that I am visionary and impractical. I have been told that I was doing these children a great injustice by making them believe that they could ever become perfect, for it could end only in disappointment for them. I believe that there is no limit to what can be accomplished with the spastic child if we can have him long enough and under the right conditions. I do not think this can be done in a few months or even in a few years in most cases, but because it is slow does not mean that it is impossible. But to really get results with them we must believe in them so firmly that nothing on earth can shake our faith, and we must *love* the work. I feel that when we take a spastic child under our care for training we have to take him into our very life, he must become almost a part of us. We cannot give him a treatment and then forget him until the next treatment. I do not mean by this that we are to think of him between treatments only as to what we will give him in the way of exercises at his next treatment, but we must hold him in our thoughts as a part of us. For it is true, I believe, that with the spastic child it is our mental power that guides and controls his muscle action until he has established within himself that mental control; and I feel that we

*Read before the Western Regional Conference of the A. P. A., Los Angeles, Calif., April, 1933.

help him to establish this control by holding him in our thoughts when he is away from us. I believe the more we live the more we will realize the power of our thoughts over those who need us and whom we are seeking to help. Tight muscles may be relaxed by a touch of your hand while working with them. I do not know whether or not this is due just to the assurance that the child feels from your nearness or if we are able to establish a more direct mental contact with him by the physical contact. At any rate you can feel the muscle "let go" and the child can use his hand or foot better than before. I do feel that to help the child we have to establish a strong mental contact between ourselves and him and *be* his mental power until he has established his own mental control. Above all he has to have faith in our ability to help him, have faith in himself, and know that we have faith in him.

We should have a quiet place to work with as little disturbance as possible, for it is very hard to hold their attention and we cannot accomplish very much unless we can get them to concentrate.

I emphasize relaxation of the over-active muscles to build up muscle balance. I work sometimes for months on a few muscles just to establish the ability to relax—just "let go," then when I have accomplished this I begin to teach the power to contract correctly—that is to use the muscles with just the necessary amount of force instead of with all the force the muscle possesses, as the child does before he is taught relaxation. I have found that the most rigid muscles can be trained to act normally by teaching relaxation, voluntary relaxation, which in time becomes a natural relaxation, and so muscle balance can be established which will allow normal muscle action. It is surprising how quickly even the small child grasps the idea of relaxation of the over-active muscles. He soon learns that the important thing is not the doing of things but to learn to hold himself correctly—just to sit or stand with as little effort as possible. Perhaps there is only one hand involved, he learns that the important thing is not to do hard things with that hand but to do the simplest things correctly. Perhaps you have a child who can walk but with tight hips and knees; you can give him easy relaxed knee swinging, perhaps making circles from the knee with hips relaxed, sitting with feet off the floor. This is a very good exercise to use toward better and easier walking. If a child has difficulty getting knee extension when standing you can help correct this by having him do knee flexion sitting. Pay no attention to extension but center his mind on bringing the knee into complete flexion but with relaxed knee flexors, then when he is put on his feet again you will find that he stands with knees straighter than before. Of course the exercise itself does not matter just so you are really training the muscles that need relaxing or that need to be taught to contract properly. The "doing of things," such as walking, dancing, swimming and using the hands to do things, is forgotten, put in the back ground until the power of relaxation of the over-active muscles is established and the muscle balance built up. Then these other things will come without very much urging in most cases.

With very severe cases where the entire body or nearly the entire body is affected and the rigidity is very great, it is sometimes necessary to work with the child in the lying position, backlying, working very slowly and rythmically. The tightest joint can be relaxed by slow rhythmic swinging. Do not try to make the full arc of movement if it causes tightness or deformity in some other part of the body. For instance, if you are working with the knee and a long swing causes the hip muscles or the muscles of the trunk to tighten, then make a short swing and slowly and gradually increase the swing as the rest of the body relaxes. When the child can lie on the table relaxed he may be placed in a chair low enough for his feet to touch the floor for support, there go through the process of getting relaxation of the whole body. When he can sit with feet flat and straight on the floor without holding on with his hands, he may be placed on a higher chair with his feet off the floor. Again you have to work to get perfect relaxation of the entire body, working with each part of the body separately, particularly the joints. I believe, although I have not worked it out thoroughly, that with these severe cases where nearly all of the muscles seem to be involved that there are a few muscles which are, to a great extent at least, causing the tightness and deformities of the whole body. For instance if there is a severe rigidity in some of the muscles around the shoulder girdle, there will be a tight elbow, wrist drop and difficulty in finger flexion and extention, and this would I believe apply to the whole body. If we can pick out these few muscles and teach relaxation we have found the key to the problem, or at least a short-cut and while it is not like "pressing a button," we have a definite starting point and will be able to get results more quickly than by working at random here and there without this definite starting point.

When the child can sit relaxed and comfortably with his feet off the floor, he may be put on the floor just sitting on the edge of the chair with the feet straight and flat. We go through the same process of getting the whole body relaxed, touching this over-active muscle, giving gentle swinging to another, etc., and when he can hold this position comfortably and naturally he is placed on his feet just leaning against the chair for support. Next he is taught to stand alone, then to walk with support, and then to walk alone. Each step of the way should be given only when the child is ready for it. Do not urge standing or walking before the child can sit comfortably and naturally. The standing position brings out the rigidity in a muscle to a much greater degree than the sitting position, consequently if he cannot sit properly it would be doubly hard for him to stand or walk, and he could do so only by a great deal of compensation which would result in deformities to be corrected later. Therefore take each step as the child is ready for it. This may seem very slow but it is sure and makes the possibilities for perfection much greater, I think. It is pretty hard to hold a child down when he starts walking. He wants to go and keep going and many of them do not care how they look just so they get there. Try to get perfection or nearly so in each step of the way of walking before going to the next step. Advise the parents against urging the child to stand or walk until he is ready for it.

When training a child who walks but not well, give plenty of support, enough to make it possible for him to walk well. You can give this support by placing your hands at his hips, at the same time instructing him to place his feet easily, by an easy relaxed swing from the hip instead of a tight lurching of the whole body. Some children walk with a great deal of "rocking" and "hunching" of the shoulders. This is due, at least in some cases, to incorrect placing of the weight. I try to correct this by very slow walking, shifting the weight entirely over one foot before lifting the other and when

the next step is taken shifting the entire weight to that foot before lifting the other foot for the next step, etc., giving as much support as is needed to make the gait normal or nearly so. Of course, the child will not retain all that you give him each treatment but he will keep a little each time until he has gained the whole.

I find it is usually better to start with the shoulder when you have a child with a wrist drop, for there is often more tightness there than in the hand itself. If you can get perfect relaxation of the shoulder the hand works a great deal better. When working with a hand I give plenty of support and help. Where there is difficulty in getting finger flexion and extension of the fingers, I support the wrist in my hand and with my other hand do the motion with the child keeping his mind on it and helping, at first only by relaxing then by contracting just the least bit, then as he does it correctly he can increase the amount he puts into it. You may have to do this for months, just this one little motion—easy, gentle flexion and extension slowly and rhythmically, do not tire of it for in time you will gain what you are working for.

I sometimes work with these children in groups. I think that there is a distinct advantage in this method especially if your time is limited. Each child will get a great deal longer period of training than if you divided the time and took each one individually. It also teaches the child to work alone, he can be working at whatever exercise you give him while you are working with the others in the group. And whether you are working directly with him or not he has his mind on working and the more you can keep his mind turned that way the more he will put into it and the more he will get out of it. Then too he establishes the habit of sitting or standing correctly when he is away from you and so he does not feel that he derives good only when you are working directly with him but that there is something for him to do the rest of the time. If you have only two hours to give and you have five or six children to treat in that time, they will each derive a great deal more from working together for the whole period than to divide it into short periods, for the longer you can keep the child's mind in that trend of thought the more quickly you can build up a lasting habit of self-correction.

Often the spastic child is accepted as mentally deficient when he is only limited in his expression. So we should not attach too much importance to mental tests for they only show the amount the child expresses and not the amount of mentality he has, or the amount he takes in. I do not claim that we can increase a child's mentality but we can help him to express more of the intelligence which he has. Often when we free him from the physical bondage which holds him we free him from something which holds him mentally and he begins to express the real amount of intelligence which he has. I find that there are a great many more spastic children who have normal mentality than are lacking in normal mentality.

I believe that more can be done for the spastic child than we have ever dreamed of if we recognize a Higher Power and ourselves as only a channel through which this Healing Power may flow.

Children's Hospital, Los Angeles, Calif.

Occupational Therapy for Spastics*

By Rachel G. Head

In working with spastic children we have departed from the idea of teaching recreational handwork and gone back to the original definition of occupational therapy as "any occupation, either mental or physical, which has been definitely prescribed for and which aids in the treatment and cure of disease or disability."

It is relatively unimportant whether a child does an inch of actual weaving all year or makes a bit of pottery worth having fired, but it is vital that he is learning to relax and to use his muscles in a more normal way.

When these exercises can be combined with the experience of learning a handicraft we have an added and very helpful factor in the eager interest of the child. Adult patients can look forward to an ultimate cure as incentive for doing curative exercises, but children can better be approached indirectly, by helping them to forget their disability and to learn to do something which interests them. All children love to make things and the joy of accomplishment is peculiarly valuable to crippled children who, too often, have established habits of helplessness and dependence and feelings of inferiority.

Many spastic children are not ready for the complicated processes involved in actually making things, but we can always have this end in view and work toward it. Take weaving for an example. A child can be seated at a loom, place his hands on the beater in a natural position and move it rhythmically back and forth in time to music, relaxing his too-tight shoulder muscles, gently exercising his arms and teaching his fingers to grasp. Or he can rest his hands easily on the front of the loom and work the treddles rhythmically up and down. The height of his chair can be increased as knee extension improves. This exercise has been found helpful in teaching children to walk, and working at the looms, to music, is peculiarly relaxing and quieting. Later the arm and leg exercises can be combined, still to music, and finally the child may be able to push a shuttle back and forth and really weave.

Other crafts may be approached in the same way, through preliminary exercises to more and more complex coordinations. Pottery is especially useful, and one of the favorites. The children can stand on wooden slabs, one for each foot, and built up so that the toes are slightly higher than the heels, to stretch the heel cords. Standing before the work bench, their shoulders will relax and working the clay is a splendid stretching and strengthening exercise for fingers. Working with the hands low, as one does when standing, corrects the tendency to draw up a spastic arm.

Basketry is another craft which can be varied indefinitely to help individual needs. Hands that are not ready to grasp a fine reed can guide a coarse one around a large, simple base. The highly nervous patients need the monotony of big, slow pieces of work. Those who are easily discouraged need to make things that can be finished in one lesson.

*Read before the Western Regional Conference of the A. P. A., Los Angeles, Calif., April, 1933.

Spastic children grow tired quickly and we have found that spending five minutes out of each school hour on rhythmic exercises is more helpful than longer and less frequent periods.

It is just because no two cases need exactly the same treatment that the work with spastic children is so interesting.

Children's Hospital, Los Angeles, Calif.

Observations on Physiotherapy Treatment of the Knee Joint*

By Hazel E. Furscott

I have often thought that I got a lot more knowledge of real practical value from a grand talk "fest" when a few physiotherapists got together and exchanged ideas, discussed cases, asked what would you do in such and such a case, in other words committed that terrible sin of talking shop than when I heard a formal lecture.

We all have our little pet technique be it in message, thermotherapy, muscle training or any of the modalities at our disposal and if our "pet" idea works it must have scientific background or it wouldn't be infallible. All of us have worked out details of technique which we are rightfully sure of because they get results but how many of us have tried to find out why our pet technique is better than that of our neighbor who is conscientiously striving for the same results, whereas our neighbor gets better results than we do along some other line. For example, I have a couple of "tricks of the trade" that I have worked out in the after care of injury. For the purposes of swapping my tricks for yours in this paper I looked up in the fundamental anatomy underlying them and also such discussion as I could find in the standard texts of orthopedics. I found at first to my dismay, and after a bit of thought to my satisfaction, my "tricks" weren't original at all. They were successful because they were orthopedically sound. I am going to endeavor to give you one of these and ask some questions of you in exchange when I finish.

First of all I admit my technique in the case I shall discuss is a minutiae in the vast number of technical details that we have at our disposal; I admit that they are not original and I am hoping to have in exchange some advice on one or two details I have been unable to solve for myself.

Every physiotherapist treating fracture or other injuries of the leg realizes the great disability caused by the loss of even a few degrees of extension in the knee joint.

Overcoming this very disabling limitation is usually the problem of the physiotherapist. Our orders from the doctor are usually in this case heat application in some form, massage and exercise. As the heat and massage are merely preliminary to the exercise or manipulation it is in the last that we must use our judgment.

In the recent injury we may resort to passive movement and follow it by active movement and achieve our result with muscle training. There is the school of thought which prohibits the use of passive movement on the ground of its obvious dangers and preferring only the use of active movement. They feel that the patient who gets the warning of pain can stop short of the danger point. But as Mennell points out, passive movement properly administered has its place. He insists that passive movement should mean relaxed movement. That is, the patient must be trained to relax the antagonists or else passive movement becomes forced movement against resistance and as such may be dangerous. In the recent injury there is a time when active movement is impossible as in case of recent fracture as yet unhealed. Then passive movement or as Mannell prefers to call it relaxed movement is a prophylactic measure to reduce subsequent stiffness, loss of power, loss of joint and muscle sense to prevent contractures and the formation of definite adhesions either in the joint or the soft tissues related to the joint.

Next the patient is trained to contract muscles voluntarily without movement of the joint. In the case of the knee of which we are speaking the quadriceps can learn to contract strongly while the patient is still in a cast or splint. Very little exercise will maintain a muscle that would quickly degenerate without that little. It will also help to maintain that sense of coordination which the rested muscle so quickly forgets, and the follow up of such treatment is naturally free movement, assisted movement and resisted movement until the joint function is normal.

I believe that if we could all work on recent injuries under perfect conditions it would be agreed that there would be no place for forced movement but who of us do not have sent to us the old case with a stiff knee lacking the few degrees of extension that mean weight bearing, where there are definite adhesions and adaptive shortening of the soft tissues and where relaxed movement within the limits of pain or active movement is the impossible. Whenever real adhesions have formed the only hope of a moving joint is forced manipulation.

The text books advise that the operator use a slow, steady and gradually increasing pull, the use of weights or splints but in the case of the knee I have found that these procedures though effective, can only act on the knee in so far as we consider the knee joint as a pure hinge capable only of extension and flexion and do not consider the slight rotation which exists in the knee.

The technique to gain such rotation is to semiflex the knee, giving traction on the tibia to separate the joint surfaces and at the same time rotate the tibia inward and outward, then extend knee quickly, firmly, forcibly, not jerkily to the fullest extent. It is interesting as an aside that this technique which is only to gain loss of extension in a stiff knee is identical with the orthopedic procedure used for dislocation of the semilunar cartilage.

This manipulation will regain loss of extension and though worked out with that in mind will also increase flexion as will be seen in reviewing the anatomy of the knee.

I apologize for reviewing anatomy before a group

*Read before the Western Regional Conference, Los Angeles, Calif., April, 1933.

such as this but I feel I must back my assertion and such a review is proof enough.

The knee is usually thought of as a hinge joint but is a really more complicated joint and for this reason we do not always obtain a freedom of movement by moving it in the direction of pure flexion and extension. It is in fact three articulations in one. One between each condyle of the femur and the corresponding tuberosity of the tibia which are condyloid and one between the patella and the femur which has a gliding movement but not a simple gliding movement as the articular surfaces are not mutually adapted to one another. The bones are connected together by ligaments some of which are exterior of the joint, the anterior and posterior, the internal lateral, two external lateral and the capsular, and the interior ligaments, the two crucial, two semilunar fibro-cartilages, the transverse, the coronary, a part of the capsule, and the synovial membrane.

The knee joint permits of movements of flexion and extension and in certain positions of slight rotation inward and outward. The movement is not a simple hinge flexion and extension but is complicated by some gliding and rotation. Because of the greater length of the iternal condyle and the fact that the anterior portion of its articular surface is inclined obliquely outward the axis of motion is not fixed as in a simple hinge but changes as the knee travels from extreme flexion to extension first using an axis at the back of the condyle then as extension takes place the axis moves gradually as the upper surface of the tibia glides over the condyles of the femur. At the close of the movement of extension the shifting forward of the hinge axis is accompanied by a rotation outward around a vertical axis drawn through the center of the head of the tibia when the tibia glides obliquely upward and outward over surface of the inner condyle. In flexion the converse of these movements takes place. As the tibia glides backward round the end of the femur at the commencement of the movement the tibia is directed downward and inward along the oblique curve of the inner condyle and an inward rotation is effected.

Now to further complicate knee movement we must introduce the subject of the interarticular fibro-cartilages which are intended it seems, to adapt the surface of the tibia to the shape of the femur and to fill up the intervals which would otherwise be left in the varying positions of the joint. In addition then, to the slight rotations caused by the greater length and facing of the internal condyle the tibia has an independent rotation between the fibro-cartilages and the tibia. This latter rotation only takes place in the semiflexed position when the ligaments are relaxed.

In semiflexion the crossed ligaments as well as the laterals are partially relaxed, allowing rotation of the tibia on the femur.

If we neglect to recognize this rotation of the knee in its manipulation we may allow definite adhesions to form although we are conscientiously exercising the leg.

I have tried to enlarge on a mere detail in technique for two reasons: First, I believe it is the attention to small details that is all important in our work and secondly, I am hoping to hear of some hints no matter on what subject that may be of help to me.

Fitzhugh Building, 384 Post St., San Francisco, Calif.

Physiotherapy in Canada*

By Beatrice E. Chadwick

The Canadian Association of Massage and Remedial Gymnastics was incorporated by Dominion Charter in 1920. The members of the Association bind themselves to work only under medical direction and not to advertise in any way except in recognized medical journals. Their offices have no signs, and therefore it is only through the intermediation of the medical men and hospitals that their services can be secured.

The standard of training is high. The requirements at present are a two years course of training in university and hospital work in remedial gymnastics (which include the re-education of muscles and pre and post-natal work) massage, electro-therapy, and all forms of treatment by heat and light.

This course is provided by the University of Toronto. In addition the University arranges that the graduates of the above course shall serve for six months as interns after graduation, which service is obligatory. In this way valuable experience in clinical work is obtained.

Some of these students have taken the combined three years course, giving them a diploma in occupational therapy as well.

Internships have been established in hospitals in Winnipeg, London, Hamilton, Toronto and Montreal.

Owing to the necessity of protecting the public, hospitals and the medical profession from unqualified assistants the C. A. M. R. G. was formed some thirteen years ago, a body similar in purpose to the Chartered Society of Massage and Medical Gymnastics in Great Britain. Only fully qualified persons are eligible for membership.

There is a local branch in Montreal with about twenty-three members, one in Toronto with about forty-eight members, one in Vancouver, B. C., with about twenty-two members, there are about ten other members scattered in other parts of British Columbia.

Huge mountain ranges and thousands of miles of rolling prairie land separate Vancouver, B. C., from the other branches of the Association in Toronto and Montreal. In the intervening space many members are scattered, working to uphold the ideals of our Association, sometimes the brave soldier gets lonely and discouraged, for the path is not easy and the work is very exhausing under these conditions, it is such a help morally and intellectually to be able to attend a Chapter meeting occasionally and compare notes with our comrades.

Unfortunately, the Medical profession in Canada, especially in Western Canada, does not appear to be fully alive to the fact that our first object is to co-operate with them and only work under their direction. Registers are kept in the larger cities of Canada and Doctors can be assured of receiving technical aid from

*Read before the Western Regional Conference of the A. P. A., Los Angeles, Calif., April, 1933.

persons who are well trained in their work and who submit to an ethical code which insures loyalty to the medical profession.

The C. A. M. R. G. has formed a Publicity Committee under the leadership of Mrs. Duncan Graham in Toronto and now there is a local convenor of this committee in each part of the country, the present convenor for British Columbia is Miss Beatrice Gallop, 419 Vancouver Block, Vancouver, B. C. The local publicity convenor for the Toronto branch is Miss E. Ely, General Hospital, Toronto, who is a past president of the C. A. M. R. G.

Their plan has been to bring the interests of the Association before the Medical Profession as an Association whenever possible, by articles, visits of members and lectures to further the interests of the Association under the control of the governing committee.

One of the members is working for the Red Cross Society in Prince Edward Island, and we are hoping when conditions improve, to interest this organization still more in the services we can offer.

The Workmen's Compensation Board of British Columbia will not employ any Physiotherapist who is not a member, and in Toronto quite a number of our members are employed by the Workmen's Compensation Board there.

Lately much interest has been shown in the treatment of post-natal cases by means of exercises and massage. This work was commenced by Sister Randell at St. Thomas' Hospital, London, England. Dr. Helen McMurchy of the Department of Public Health in Ottawa has shown a very active interest in its scope. Last year a member began this work in Montreal as a voluntary worker in one of their hospitals and now she has had the value of her services fully recognized and is employed by this hospital on a salary. Miss E. Ely is very much interested in a course of training in this work which is just commencing at the Toronto General Hospital where Physiotherapy will be a routine procedure for all maternity patients unless it is contra-indicated. Miss Ely has just returned from a year in London, England, where she worked with Sister Randell on the teaching staff of St. Thomas' Hospital under the direction of Dr. J. B. Mennell.

Another member specialized in the treatment of Infantile Paralysis in the tank, and now Montreal has a tank and we are trying to assist this type of work with training in slings after the scheme of Mrs. Guthrie Smith of London, England.

Physiotherapy has proved its value in traumatic cases, in arthritis, in deformities, in diseases of the nervous system and in abdominal and many other conditions. Its value in post-natal care is becoming more appreciated.

"Monotherapy is by no means Physiotherapy" failures are frequently due to too implicit reliance upon one or perhaps two pieces of equipment, a situation comparable to that of an internist limited to but one drug. Moreover there is a growing realization that physical treatment gives best results when in the hands of those especially qualified.

Dr. James Mennell, of St. Thomas' Hospital, London, England, speaking before the recent Public Health Congress emphasized that: "In all treatment the skill is with the administrator and not with the apparatus."

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May I tender my thanks to Miss E. Ely of Toronto and Miss B. Gallop, Vancouver, B. C., and the Canadian Medical Association Journal, for help in facts concerning the activities of the Canadian Association of Massage and Remedial Gymnastics.

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Abstracts

By John S. Coulter, M.D.

The Utilization of Physiotherapy in Hospitals. Sec. of Editorial Comments, in Canad. M. A. J., XXVIII:4:427, April, 1933.

Enquiries are received from time to time respecting the development of physiotherapy departments in hospitals and the staffing of such. Practically every general hospital of any size has certain physiotherapy apparatus and many have most extensive equipment. More and more it is being realized that physiotherapy has a distinct place in the treatment of the patient—possibly not as dominant a position as has been claimed for it by the ultra-enthusiast, but certainly a more vital role than has been realized by a large proportion of the profession. It is being realized also that any analysis of the costs of sickness must take into consideration the time-factor, the period under treatment, and the time away from work. With the increasing accuracy and efficiency of medical and hospital care, costs are bound to rise, but if formerly partial cures become complete ones, and if patients return to work in a fraction of the time formerly required to convalesce, the actual cost to the individual and to the community may be, and has been proved to be, considerably less than formerly.

Physiotherapy has proved its value in traumatic cases, in arthritis, in deformities, in diseases of the nervous system and in abdominal and many other conditions. Its value in post-natal care, to avert the "tired mother" syndrome, is becoming more appreciated. However, as pointed out in this Journal in a recent series of articles on physiotherapy and roentgenotherapy prepared by the Radiological Section of the Canadian Medical Association, "Monotherapy is by no means physiotherapy." Failures are frequently due to too implicit reliance upon one or perhaps but two pieces of equipment, a situation comparable to that of an internist limited to but one drug. Moreover, there is a growing realization that physical treatment gives best results when in the hands of those especially qualified. Dr. James Mennell, of St. Thomas' Hospital, speaking before the recent Public Health Congress, emphasized that "in all treatment the skill is with the administrator and not with the apparatus."

In most of our hospitals where the equipment is sufficient to warrant the creation of a department or service, a member of the medical staff, frequently the roentgenologist, is in charge and he is assisted by one or more technicians. In some hospitals a specially trained Sister is in charge, with a physician appointed in an advisory capacity. In certain large institutions a full-time medically trained physical therapeutist administers the department. We are particularly fortunate in Canada in having available as workers in these departments graduates of the two-year course in physiotherapy which is maintained by

the University of Toronto. Some of these students have taken the combined three-year course giving them a diploma in occupational therapy as well. During the last few years interneships in physiotherapy have been established in connection with this course in hospitals in Winnipeg, London, Hamilton, Toronto and Montreal. Owing to the necessity of protecting the public, hospitals and the profession from unqualified assistants, the Canadian Association of Massage and Remedial Gymnastics was formed some thirteen years ago, a body similar in purpose to the Chartered Society of Massage and Medical Gymnastics in Great Britain. Only fully qualified persons are eligible for membership, and the members bind themselves to work only under medical direction and not to advertise in any way, except in recognized medical journals. Such an ethical group of trained workers deserves the hearty support of the profession and the hospitals.

A more detailed account of this Association can be found elsewhere in this issue, under "General News." Harvey Agnew.

Efficiency and Economics as Applied to the Physical more or less of a fad. The student should learn that Assistant Professor and Head of Physical Therapy Department, Northwestern University Medical School; in Bulletin of Am. Coll. Surg., XVII:1:19, March, 1933.

Physical therapy is here to stay, and every hospital, if it is to fulfill its fundamental purpose, must provide some form of department for the use of physical agents in treatment. The value of a hospital physical therapy department, and the dangers of not providing such a department are shown in a recent analysis of fifty hospitalized chronic arthritis cases by the Mayo Clinic. Although the average duration of the disease was five to seven years on admission, only sixteen patients had been advised by their regular physician to have massage, only eight had been given exercises, corrective or preventive of deformities, and only four had been given supervised applications of heat for a period longer than two months. About half of this group had been sent to spas or other resorts, which indicates that the value of physical therapy was recognized. All of this group needed some form of physical therapy; however, the physician had prescribed it in only a small percentage of cases, but had sent about half of the group away to resorts for the treatment that should have been available in their local hospitals. The dangers of this lack of use of physical therapy and its unavailability are that the patients will seek this form of treatment in the hands of the various cults and neglect the careful physical and laboratory examinations and other forms of treatment that should precede and follow the use of these agents as adjuncts in the treatment of disease.

To be efficient a hospital physical therapy department must be under the control of a physician. For efficiency and economy in this department the second requirement is well trained technical personnel.

In order to secure efficiency of a physical therapy department the director should make every effort to put before the hospital staff information relative to this subject by the following:

1. Staff meetings. This department should be allowed one meeting yearly to demonstrate its work. The director should enter discussions at other meetings where physical agents would be of use in the cases brought before the meeting.

2. Clinics. In cities where clinics are given the department director should give scheduled clinics demonstrating the treatment of various conditions by physical therapy or assisting in clinics of the other departments.

3. Lectures to internes, and having the laboratory interne assigned to duty in the hospital physical therapy department when he is needed.

4. Lectures to members of the nurses' training school. It is essential that the nurses of a hospital should have some knowledge of physical therapy, for all the good accomplished by an hour's treatment in the physical therapy department may be lost during the remainder of the twenty-four hours if the nurse does not cooperate. For example, in the treatment of a weakened deltoid muscle following a shoulder injury all treatment by heat, massage, exercise and electrical muscle stimulation would be unsuccessful if the patient is permitted by the attending nurse to rest in bed with the arm at the side.

A department directed by a physician and with trained personnel will soon secure proper equipment, location and space. This has been proven frequently. Proper equipment is essential for much of the needed treatment and our departments are well equipped, but no hospital should hesitate to start a department without equipment and in any space that is available provided there is the proper personnel. The essentials for efficiency and economy in this department are direction by a physician, treatments administered by a trained technician, and provision made for the cooperation of the patients in the use of physical agents without expensive apparatus when they are away from the department.

Who Should Teach Physical Therapy. Sec. of Association News, Jour. A. M. A., 100:18:1435, May 6, 1933.

Dr. F. J. Gaenslen, Madison, Wisconsin: It may be well if we as teachers consider treatment under the three heads of medicine, surgery and physical therapy, in order to keep in mind that there is a definite place for physical therapy in treatment. The foundation of instruction of the undergraduate in physical therapy should be laid in a didactic and practical course preferably in the third year. The didactic course can probably be adequately covered by one lecture a week during a single semester, while the clinical application can be covered in a practical course of perhaps double the period given to lectures. The general course must be comprehensive, including the consideration of every type of physical therapy. If there is lack of cooperation on the part of clinical instructors, the student is apt to get the idea that physical therapy is more or less of a fad. The student should learn that heliotherapy may spell the difference between arrest and recovery in bone and joint tuberculosis, that there is ample clinical evidence that ultraviolet radiation is a specific in rickets, and that it promotes the development of sound bones and teeth. He should learn the uses, therapeutic and diagnostic, of the galvanic and faradic currents in various forms of nerve injury. He should learn that massage and muscle training are of far more practical value in rehabilitation than electricity. While muscles will frequently respond to suitable currents, the response is confined practically to a single segment in the neuromuscular unit. The voluntary effort and resulting motion, however slight, exercises not only the muscle but the upper and lower motor neurons as well as the muscle fibers. The voluntary effort, however feeble, calls every portion of the neuromuscular apparatus into play. No opportunity should be lost in pointing out limitations to any type of physical therapy. A careful diagnosis is of first importance, the pathology of the part being constantly visualized.

Physical Therapy Test for Reaction of Degeneration. Editorial in Penna. M. J., XXXVI:6:459, March, 1933.

This is an electric test to determine whether a motor paralysis is central or peripheral in origin. The muscles affected are stimulated with the galvanic and faradic currents, and the responses noted. By this method one can determine also whether or not a nerve has been severed. One may also give a prognosis as to the probable duration of the disability.

Equipment necessary:

1. A faradic coil.
2. A galvanic current source.
3. A dispersing electrode (3 inches by 6 inches or larger).
4. A testing electrode (with interrupter).
5. Charts showing motor points of various muscles. (These latter are a necessity.)

To test a muscle or group of muscles which are paralyzed:

1. Apply the faradic current to the unaffected side and note the amount of faradism necessary to cause a vigorous contraction.
2. Test the affected side and note:

(a) Whether it responds to the same amount of current.

(b) Whether more is necessary.

(c) Whether it fails to respond.

3. Now apply the galvanic current in a similar manner, but in addition note carefully whether the reaction is slowed. Determine also which pole causes the greater contraction. (Normally the negative pole should.) If the positive pole gives the greater contraction, there is complete reaction of degeneration.

These tests, after the tenth day of paralysis, will permit of the following deductions (according to Granger):

1. Quantitative loss to faradism. (It takes more faradic current, but the muscle contracts.) Duration of disability two or three weeks.
2. No response to faradism, but galvanic reaction normal. Disability four to eight weeks.
3. Quantitative loss to galvanism, negative pole giving greater reaction, associated with slowing of muscle contraction.
4. Reaction to positive and negative galvanic poles equal. Disability 15 to 24 weeks.
5. Positive galvanic pole gives greater reaction. Disability 30 to 40 weeks.

Explanation of reaction of degeneration test:

The reason one gets no muscle response to faradic current if there is reaction of degeneration (R.D.) is because the impulse is too short for the muscle to respond if the nerve is "out of commission."

The galvanic current being constant continues until the muscle responds.

In testing for reaction of degeneration, use the faradic first, as described.

If the muscles respond, there is no reaction of degeneration.

One does not get a typical reaction until about ten days after the onset of paralysis.

If there is even a little reaction to the faradic current, the prognosis is good, and one can predict that the response will return.

The reaction of degeneration indicates that there is a lesion somewhere in the lower motor neuron; i. e., between the anterior horn cell and the peripheral nerve ending.

If the lesion affects the upper motor neuron, i. e., the nerve track between the cerebral cortex and the anterior horn cells, reaction of degeneration is not seen.

Tissue Stimulating Substance and Action of Massage. Abst. in Jour. A. M. A., 100:17:1374, April 29, 1933, from Schweiz. med. Wchnschr., 63:163 (Feb. 18) 1933.

According to Ruhmann, tissue stimulating substances (so-called tissue hormones) are constituent substances of the body that are liberated within the tissues by stimulation and increase the functional condition of these tissues or of their nervous and vascular apparatus, respectively. In comparing the effects of the iontophoretic introduction of the best known tissue stimulating substances (histamine, acetylcholine and the circulatory hormone of the pancreas) with those of massage, it was found that the iontophoresis with acetylcholine produced effects that resembled massage action most closely. From this the author concludes that the tissue stimulating substance liberated by massage is acetylcholine or is very closely related to it. Moreover, he believes that the hyperemia produced by massage in the deeper tissues is also the result of the liberation of choline-like substances. Whereas acetocholine as such produces muscular contraction, it decreases the tension in the changed condition of the muscle during increased muscular tonus. The author thinks that the release of involuntarily increased muscular tension by massage is probably to be explained by humoral action. If the sympathetic nervous system conducts the pain, the decrease in pain conduction by massage may be the result of the liberation of a parasympathetically active tissue stimulant such as acetylcholine. It is probable that, in addition to choline-like substances, other metabolic substances, such as adenosin, may play a part in the local action of massage, but it will require further studies to determine this.

Saneness in Maintaining Physical Efficiency. George A. Skinner, M.D., Colonel, Medical Corps, U. S. Army, Omaha, Nebraska, in J. Missouri M. A., 30:4:158, April, 1933.

That physical efficiency is paramount to any marked degree of success does not admit of argument. There have been a few notable examples of success in spite of physical handicaps, but they are comparatively very few. With physical disability usually comes the necessity of retirement from the chosen calling. Therefore, methods that tend to prolong useful activity, and thereby the happiness and contentment of individuals, are well worth the consideration of the medical profession. Perhaps no body of men are greater slackers in maintaining their own physical efficiency than the doctors themselves. This is not because they do not know the needs, but either they think themselves too busy or they are simply careless of their own welfare. The subject of physical efficiency is probably more impressed upon those of us who are in the military service than upon those in civil practice because we must be physically fit when we enter the service and must keep so at all times; it is as much a part of our job to be physically ready for field activity at any moment as it is to be prepared professionally to give high class medical service. Any deficiency, physical or mental, is at once noted, and if not corrected, we have the opportunity of seeking other employment. In my opinion something of the same sane recognition of the absolute need of physical fitness should be adopted by the medical profession and by them passed on to their clientele. This would result in a real forward step in physical betterment of the entire population.

Intensive training may be successful perhaps in handling youth but it is not in any sense adapted to the needs of older men and should be considered only to be avoided. It is not difficult to visualize the damage that may be done to middle aged men taken from sedentary occupations and without preparation placed in strenuous physical training lasting hours daily. Such training is

certain to result disastrously to a fair percentage of the men; whereas, if the training comes on by slow stages, giving time for readjustments and muscle building, there will be practically no harm. Such a course or method of training for physical strains will prepare not only the physically sound but will do much to improve the physical efficiency of the handicapped.

Examples of strenuous physical activities into advanced life are not particularly rare and nearly every gymnasium boasts of at least one man who is playing handball or tennis at seventy or more years of age. The wisdom of any man much past fifty indulging in such active sports may be questioned, but when they do and with no apparent damage over a long period it is almost without exception because they have never been out of training and have in that way maintained a high degree of physical excellence much longer than the average period.

The medical profession has a great opportunity for service to the public in bringing to it the need of a much more consistent method of keeping physically fit. Everyone is interested in maintaining himself in the best possible condition, and many more will do it if it can be made to appear to them more worth while. But so many seem to be of the opinion that an occasional period of exercise is all that is necessary to accomplish this end that it is difficult to get across what are the real facts. Advertisements of certain mechanical apparatus that is supposed in twenty minutes a day to completely replace every form of physical exercise, and other equally absurd claims for systems and machines, have convinced a fair number of people that physical movements are unnecessary and archaic. Taking exercise by proxy has also become fairly common; a man attending a baseball or football game and taking a more or less active part in the "rooting" while he consumes his peanuts and "hot dogs," feels that he has had a good day's exercise.

Discussion on the Value of Physical Methods in the Treatment of Heart Disease. Section on Physical Medicine, Proc. Royal Soc. Medicine, XXVI:5:539, March, 1933.

Dr. F. G. Thomson: The physiological effects of an appropriate course of balneological treatment in reference to the cardio-vascular system may be summarized as follows:

1. The promotion of a more natural, free, and active peripheral circulation.
2. Reflex stimulation of the heart itself.
3. More active metabolism, and elimination of toxic end products.
4. Reduction of obesity.

Massage.—The effects of massage are similar in a way to those of baths, in that the circulation through the skin and subcutaneous tissues and muscles is stimulated, with probably some reflex stimulation of the heart itself.

Exercises.—The determination of the type and amount of exercise allowed in a case of myocardial deficiency forms an important element in the treatment. In serious cases, such, for instance, as toxic myocarditis following severe influenza, Schott's resistance exercises may be of value. In other cases the patient may perhaps be limited to carefully graduated walking exercises. When more active exercise is allowed, it is important to remember that, so far as possible, it should be in such a form as affords pleasure or recreation to the patient. As Sir Douglas Powell aptly put it, "the wielding of a salmon rod is a resistance exercise equal to and more amusing than any of those at Nauheim." Whatever the form of exercise allowed it is important that it should not be overdone, and the patient should be warned that symptoms of distress should always be taken as an indication to stop.

Breathing exercises, especially in the form of slow, deep inspirations, with firm contraction of the abdominal muscles, are of the greatest value, by emptying the abdominal veins and increasing splanchnic vasomotor tones.

I would rule out entirely all cases of malignant endocarditis. Such cases are entirely unsuitable. Cases of advanced cardio-vascular degeneration with serious impairment of the myocardium, anginal attacks, aortic disease, or renal insufficiency are, again, obviously unsuitable. Active physical treatment is more likely to do them harm than good. Thirdly, I should rule out all cases of tachycardia, palpitation, or other cardiac symptoms associated with exophthalmic goitre or hyperthyroidism.

Firstly, among the cases which would appear to be suitable for physical treatment come these in which the heart muscle is debilitated by infection. The importance of infection as a factor in causing cardiac disabilities is not always fully recognized.

Functional disorders dependent on extrinsic causes.—Cases of this type are generally regarded as being specially suitable for physical treatment in one form or another, but whether they are so or not depends entirely on the underlying cause. The main symptoms are (1) palpitation, frequently accompanied by an irregular pulse due to extracystoles; (2) vague symptoms of precordial distress, "fluttering" or even pain in an otherwise healthy heart; and (3) fainting.

Dr. B. T. Parsons-Smith: It is customary nowadays to divide heart affections into two main groups:

(1) The functional;

(2) The structural or organic.

In both these groups we recognize a defective circulatory reserve, and this, for its improvement, will call for careful discrimination in the method or system of remedial methods we may be disposed to recommend.

A moment's consideration of certain physiological principles will suffice to provide conclusive evidence in regard to the whole question:

(1) The rate and volume of venous circulation depend to a large extent upon respiratory influences and vary in direct proportion to the frequency and depth of the pulmonary excursion; the effect of deep breathing exercises, therefore, is to hasten the venous return, to distend the auricles which reflexly respond by more vigorous and rapid contraction and so to originate an increase in the heart's stroke volume and energy output.

(2) By increasing the range of the respiratory excursion, air stagnation in the lungs is obviated, the pulmonary capillaries are more adequately expanded, the circulation in the lesser circuit is facilitated and the processes of aeration are relatively encouraged.

(3) Via the influence of deep breathing and the increased diaphragmatic mobility induced thereby, the circulation in the abdominal organs is augmented, the functional efficiency of the latter is adjusted and the venous return to the right auricle is proportionally expedited.

The above may be regarded as the outstanding natural phenomena on which respiratory exercises depend for their potential curative properties in circulatory disorders, and of them all one would more particularly stress the stimulating influence on the myocardium of the suitable loading which an increased venous return to the heart provides.

As one might reasonably expect, the value of breathing exercises can as a rule be assessed by careful investiga-

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tion of the patient's symptoms and physical signs; from the point of view of these latter it is obviously essential that frequent observations shall be made and compared, in order to estimate the degree of improvement or otherwise in the mechanical efficiency of the circulation, and that, whenever possible, such observations shall be controlled by suitable tests of exercise tolerance.

Dr. T. F. Cotton: Of all diseases of the circulatory system the most common is hypertensive heart disease, with cardiac hypertrophy and arteriosclerosis as the cardinal features. If we limit ourselves to this type of cardiovascular pathology in its relation to physical therapy, it will be found that a large field of inquiry can be included in this discussion. We might with advantage discuss the Physiotherapeutics of hypertension in its narrower relation to the peripheral vascular circulation.

A very large majority of hypertensive subjects die from heart failure or cerebral apoplexy. Those with heart failure, congestive or anginal, require physical and mental rest. Passive muscular exercise in the form of massage takes the place of active exercise, and is a means of increasing the blood flow in the peripheral vessels; in this way it is effective in lessening the nutritional defects of venous stasis. General light massage may also be prescribed for its sedative action in promoting sleep. Whenever active exercise restrictions are imposed, passive exercise in this form or graded exercises are helpful, as in other maladies requiring a prolonged resting regime.

In heart failure of the anginal type we have an expression of cardiac ischemia from morbid changes in the coronary arteries, and vasoconstriction may form an integral part of the pain mechanism. The nitrites bring relief of pain by their vasodilating action on these vessels. A rise of the deep temperature in the tissues surrounding the heart should produce a local hyperaemia, and one might expect an increased blood-flow in the coronary circulation, from vasodilatation. Diathermy is used with this object. Levine and others have shown from observations on animals, that heat penetration is slight when intense diathermy has been employed. Clinical experience supports this view that electricity is not effective in controlling anginal pain.

In obstructive arterial disease of the peripheral vessels vascular spasm may be an added factor contributing to a reduced blood supply to the tissues, and may be a principal cause of ischemic symptoms. This functional element may be closely related to hypersensitivity of the vessel wall to cold, and thermotherapy—either climatic or the direct application of heat—is a rational form of treatment to relieve symptoms due to arterial obstruction of this type, although the underlying causes remain.

If we regard the end results of physiotherapy in terms of blood pressure readings we shall not record many therapeutic triumphs. No one can deny the useful purpose which the sphygmomanometer serves in the identification of cardiovascular disease, but until more is known about the significance of this perversion of function, recognized clinically as hypertension, the natural history of the disease should not be followed too closely by this method of examination. It is wrong, in the practical management of diseased subjects belonging to this class, to interpret with too great exactitude the change in the physical signs effected by physiotherapeutic agents. A fall in blood pressure does not necessarily signify an improved peripheral circulation, and a rise in blood pressure may be caused by the release of a physiological mechanism which is essential to combat a pathological process.

Dr. Geoffrey Holmes described balneological methods of treatment, of which his experience has been gradually gained by the employment of baths in other conditions with which there had been associated such a degree of cardiovascular debility that it had, of necessity, influenced and modified the type of treatment given.

As evidence of the marked effect of warm immersion baths upon the circulatory system, Dr. Holmes referred to the experiments he had carried out with Dr. Whitridge Davies, which showed acceleration of the pulse, maintenance or slight increase of the systolic blood pressure, and considerable reduction of diastolic pressure. It had also been found that immersion in warm sulphur baths caused more hyperaemia and more prolonged sweating than did immersion in plain water baths at the same temperature. Whilst in Germany both doctors and patients regarded carbon dioxide baths as first amongst the methods of physical treatment of cardiovascular disorders, in this country douche-massage baths were more frequently used. In the old handbooks it was stated that the Aix douche lowered blood pressure and the Vichy douche raised it, but when one considered the technique of the two types of douche-massage—of which the variable factors were temperature, duration, type of jet and pressure with which the water was applied, kind of massage given, and immediate after-treatment, e. g., by warm or cold showers or hot blanket packs—it was obvious that either treatment could be given so as to have a stimulating or sedative effect on the peripheral circulation.

The Significance and Treatment of Sciatic Pain. Winchell McK. Craig, M.D., and Ralph K. Ghormley, M.D., Rochester, Minnesota, in Jour. A.M.A., 100:15:1143, April 15, 1933.

METHODS OF TREATMENT EMPLOYED AT THE MAYO CLINIC FOR AMBULANT PATIENTS

Epidural Injection.—Complete and permanent relief was obtained in 52 per cent of a group of eighty ambulatory patients treated by epidural injection. The patients were kept in bed for twenty-four hours following the injection. Another 24 per cent of the patients were partially relieved, but further treatment was required before relief became permanent. Twenty-two per cent were not relieved. In the group in which complete relief was obtained, the symptoms had been present for from three weeks to eighteen years. The ages of the patients varied from 22 to 59 years; 80 per cent were men and 20 per cent were women.

It was noted that 34.5 per cent of the patients who were relieved by epidural injection had pain low in the back associated with sciatic pain; the pain of 61 per cent was confined to the thigh and leg, and only 5.5 per cent complained of pain limited to the leg. The left leg was affected in 57 per cent of the cases, and the right leg in 43 per cent; the reason for this difference was not apparent.

Diathermy.—In view of the fact that the condition of only 52 per cent of the ambulatory patients was completely relieved by epidural injection, we were interested in comparing the results with those from other methods of treatment. A series of thirty-six consecutive cases in which the patients received daily treatment by diathermy was reviewed. In this group it was found that twelve (33 per cent) of the patients were entirely relieved of pain. The duration of symptoms covered periods of from sixteen years to one month. In this group there were twenty women and sixteen men; the oldest was 78 years of age, and the youngest 24. Four of the patients who were relieved presented roentgenologic evidence of hypertrophic arthritis of the lumbar vertebrae or sacro-iliac joints, and one gave evidence of sacralization of the fifth lumbar vertebra. One patient gave a history

of trauma, consisting of a fall on ice, which initiated the pain. One patient who previously had lost the achilles reflex was completely relieved. Three of the patients had infected tonsils which were removed during the treatment, and a periapical focus was removed from one patient.

Epidural Injection and Diathermy.—These methods were combined in the treatment of twenty-four cases without hospitalizing the patients for a longer time than was necessary for the treatments. There were three cases in which the patellar reflexes were diminished to —2, and the achilles reflexes were diminished to the same degree. In this group, nine (42 per cent) obtained complete relief. Thirteen of the patients were men and eight were women. The oldest was 42 years of age, and the youngest 23. The longest duration of pain was five years, and the shortest was two months. Roentgenologic evidence of hypertrophic arthritis was observed in one case, and in three cases there was a history of trauma, consisting respectively of a fall from a truck, a fall from a railroad car, and a fall on the floor striking the back.

Sacro-Iliac Belt and Diathermy.—We investigated the results of support by means of the sacro-iliac belt and daily treatments with diathermy. In this group there were fifty-two patients. In four cases the achilles and patellar reflexes were abolished. Seventeen patients (32.6 per cent), nine men and eight women, obtained complete relief, and seven others were moderately relieved. The oldest patient relieved was 74 years of age and the youngest 23. The longest history of symptoms was nine years, and the shortest was two months. In four cases there was roentgenologic evidence of hypertrophic arthritis of the lumbar vertebrae or sacro-iliac joints. In three cases, foci of infection were found and eliminated.

Epidural Injection, Sacro-Iliac Belt and Diathermy.—Realizing that each of the ambulant forms of treatment was followed by complete relief in some but not in all cases of sciatic pain, we investigated the results from a combination of the three methods. Fourteen patients were thus treated. The achilles reflexes were abolished in two cases. Twelve patients (85 per cent) were completely relieved. In the cases in which treatment was successful, it was found that the longest duration of symptoms was six years, and the shortest three weeks. The oldest patient was 44 years of age, the youngest 26. In only one case was there roentgenologic evidence of arthritis, and in only one was there sufficient evidence of the tonsils to warrant their removal. In two other cases there was associated scoliosis which was relieved by treatment.

METHODS OF TREATMENT EMPLOYED AT THE MAYO CLINIC FOR PATIENTS CONFINED TO BED

Rest in bed, Epidural Injection, Diathermy, Buck's Extension, Intravenous Injections of Foreign Protein, and Elimination of Foci of Infection.—This series included twenty-eight cases. In five cases the achilles or patellar reflexes were abolished, and in five others there was roentgenologic evidence of associated arthritis, involving the lumbar vertebrae or sacro-iliac joints. All patients obtained some relief. Only twenty-four (85.7 per cent) could be considered completely relieved, and the other four were moderately relieved.

Rest in Bed, Diathermy, Buck's Extension, Intravenous Injection of Foreign Protein and Elimination of Foci of Infection.—There were thirty cases in this group. In six, patellar and achilles reflexes were abolished. In nineteen cases (63 per cent) paint was completely relieved. In seven other cases there was moderate relief. The oldest patient was 59 years of age, and the youngest 24.

Other forms of Treatment.—The more radical forms of treatment of sciatic pain definitely associated with low backache are beyond the scope of this paper. It is to be pointed out, however, that some patients who do not respond to the outlined forms of treatment may respond to manipulations under anesthesia, followed by the use of a plaster spica cast. These patients, however, must be carefully selected, and usually should be those with severe sciatics coliosis and marked muscle spasm which it is desirable to relieve by anesthesia. Finally, there is a small group of cases, to be selected with the utmost care, in which treatment should be surgical, with the object of causing fusion of the lumbosacral or sacro-iliac joint, or both.

The Human Foot: Functional Development and Weaknesses. Melvin S. Henderson, M.D., Rochester, Minn., in Minnesota Med. xvi:5:323, May, 1933.

WEAKNESS OF LONGITUDINAL ARCH

The longitudinal arch is composed of a posterior pillar, the calcaneus and talus, and an anterior pillar, consisting of the rest of the foot in front of the ankle. The anterior pillar has two divisions: the inner one consists of the neck and head of the talus, the navicular bone, three cuneiform, and the inner three metatarsal bones; the outer division consists of the cuboid and outer two metatarsal bones. The arch is so often the cause of complaint that the term "fallen arches" has come to be used by the laity for all kinds of foot troubles. There may be no visible lowering of the arch and still a very painful foot exists.

I have arbitrarily classified the patients whom I wish to consider under four headings:

Table I. Classification of Painful Feet

1. Slender, elongated, with relaxed midtarsal region, pronated and abducted. Usually comparatively painless.
2. Weak, painful, no loss of arch, no eversion, acute flat foot. Likely to affect nurses, interns and so forth.
3. Weak, painful, with eversion and lowering of the arch, semispastic, shortening of tendo achilles.
4. Weak, painful, with rigidity, eversion and pain on inversion. Patients are often obese adult males, floor walkers, head waiters, train conductors, and so forth.

The first group consists of those with long, slender, elongated feet, relaxed particularly in the midtarsal region, pronated, moderately abducted, and with extremely flexible midtarsal and metatarsotarsal joints. This type of foot is thought by some to be the result of a congenital tendency; undoubtedly it is often a familial characteristic. It looks weak, and is flat, but may be, and in many cases is, a foot that does its duty well, with no discomfort.

The second group is composed of patients with weak, painful feet, unaccompanied by appreciable lowering of the longitudinal arch. This condition is often spoken of as acute flatfoot, and is seen not uncommonly among nurses, interns, and others, who are called on to be on their feet for long hours on hard, unyielding floors. The incidence of this condition in training schools for nurses has been considerably lessened by careful inspection of the feet of all probationers, and seeing to it that they are provided with good, sensible shoes. Experience in Rochester since these examinations have been carried out in both training schools, has been that it is very rarely necessary to take a nurse off duty. It is far better for them to carry on if possible. The regular regimen under which the young probationer nurse lives

may cause her weight to increase rapidly by ten to fifteen pounds. This, with the arduous duties on the floor, puts a great strain on the feet. The girl should be instructed not to be on her feet any more than is absolutely necessary, obtaining rest when off duty. Hot and cold foot baths, night and morning, followed by a brisk rub with a rough towel to increase circulation, and massage with alcohol or extract of Hamamelis tends to increase the vascular tone. Exercises, particularly those that will increase and enhance the power of the quadratus plantae (accessorius) muscle and the flexor digitorum longus muscle, such as picking up marbles with the toes, stretching of the peroneal muscles and those which go to make up the tendo achilles, and increasing the power of contraction of the tibialis anterior and tibialis posterior are beneficial. I have not prescribed a metal arch support for the shoes of these people for more than twenty years. When it is necessary to use an arch support, it is of felt and leather, and is fastened in the shoe. The patient should be instructed in the correct way of walking, with the feet straight ahead, and should learn the trick of flexing the toes when walking. This toe exercise will wear out more stockings but will increase the musculature of the sole of the foot. These persons should always be carefully examined to see that the pain in their feet is not due to an arthritic condition. Foci of infection, if present, must be eliminated. It is characteristic that in this type of painful feet there is little to be seen. There may be a little swelling, and localized tenderness along the arch in the region of the head of the astragalus.

The third group is composed of persons with weak painful feet, with some eversion of the foot and lowering of the arch, with a semi-spastic condition of the peroneal muscles and with some shortening of the tendo achilles. These people usually have run the gamut of arch supports, osteopathy, chiropractic, and so forth. Physiotherapy, consisting of application of heat and massage, and active and passive movements, sometimes will bring relief. Too often, however, the patients do not respond to these efforts, and more drastic measures are necessary. As in the second group, arthritis must always be considered, and foci of infection eliminated. An occasional patient has the cold, clammy, flat feet that border on the arthritic type, and the condition has been called "vasospastic flat foot." The condition occurs in young persons, and the foot is often so painful that the patient is not able to work.

The fourth group is comprised of those patients with weak, flat, painful feet, with rigidity, eversion of the foot, and extreme sensitiveness on manipulation. Static, often combined with infectious arthritis, is associated in these cases.

Body Build and its Relation to Gastric Position, Form Secretion and Motility and to Gastrointestinal Emptying Rate. Walter J. Siemsen, M.D., and Alfred C. Ledoux, M.D., Chicago, Illinois, in J. Pediat., II:6:657, June, 1933. (From the Department of Pediatrics and the Division of Roentgenology, The University of Chicago Clinics).

Undernutrition, although not limited to the slender type, is more prevalent in this class.

The prevalence of poor posture in the broad and slender and in the well nourished and poorly nourished alike is striking. The series of cases is obviously too small to warrant an attempt to associate different types of faulty posture with difference in body build. Although the width of the epigastric angle does not conform strictly to body build it may be said that a wide epigastric angle is predominant in the broad type and that a narrow angle is the common finding in the narrow type.

The shape of the chest does not correspond strictly to body build or to the width of the epigastric angle or to the form and position of the stomach. Again, the smallness of the number of cases interdicts definite conclusions. Furthermore, had even more slender subjects been available for study a greater conformity might have been observed.

No definite relation seems to exist between gastric secretory function, body build, form and position of the stomach.

Traumatic Arthritis. Frederic Jay Cotton, M.D., in N. E. J. M., 208:16:829, April 20, 1933.

It is obvious that we can have after injury exacerbations of arthritis previously present, of the "atrophic" type, whether real exacerbations of the pathology or just sprains of already half-crippled joints is open to question. That we can have, given predisposition only, a fresh arthritis of this type due to trauma is very doubtful.

In the "infectious" type, again exacerbations of the arthritis from trauma seem to happen even though the joint is but adjacent to, but not directly involved in, the trauma. They occur reasonably promptly and are typical, with heat, swelling, redness, stiffness, tenderness, pain, and some rise of temperature.

Now in relation to the hypertrophic type the situation is different. It is true that the incidence of hypertrophic changes, or at least their intensity, may be affected by trauma.

We have grown to look upon hypertrophic joint change as a matter of age of the persons or early age in an overused joint and it is hard to believe that trauma ever actually originates such process, any more than it originates sclerosis of arteries, which is in its way similar.

As to hypertrophic changes originating in injury, the presumption is always against such causation, and many lame backs, for example, have nothing to do with the bone changes undoubtedly present in the spine as they are so commonly present in middle age or later.

There are, however, two other classes usually passed as arthritis, much more directly connected with trauma. One is osteochondritis, the traumatic arthritis of Allison and Osgood. These cases show overgrowth of the cartilage and to some extent of the bone at the joint edges, with a tendency to separation by breakage or erosion of separate bodies mainly cartilaginous, often many, sometimes large, free in the joint or adherent to the capsule. Such bodies seem to grow larger by accretion in the nourishing medium of the synovial fluid.

The last form for discussion is important, but despite the assumed clinical identity it is not an arthritis at all.

The class includes those hands and feet, or sometimes other joints, that without inflammatory signs stiffen up after trauma (not always fracture or dislocation) and not only become useless in the course of convalescence but remain useless with a puzzling resistance to any routine handling. Slowly some of them improve under physiotherapy and time and use to some extent, and some are hopelessly stubborn and result in permanent lessened usefulness.

The clinical picture is typical enough, and the cases fail of recognition because people don't know about them; it is an unrecognized class of trouble to all concerned and the damage is often charged to over-immobilization, age or arthritic tendencies.

In fact, until a few years ago there would seem to have

been no recognition of the trophic circulatory background of these cases.

One has only to look at the obviously non-inflammatory picture, the low surface temperature, the slowed circulatory return, the stiffness and in more marked cases the cyanotic pallor, the hypoesthesia of the surface and the actual glazing of the skin, with total shrinkage of tissue as in the fingers, to have a clear picture of sympathetic spastic or direct trophic trouble.

The Treatment of Arthritis. Charles W. Buckley, M.D., F. R. C. P., Physician in the Devonshire Hospital for Rheumatic Diseases, Buxton; Member of the Arthritis Committee of the British Medical Association. British M. J., No. 3774, May 6, 1933, page 774.

CLASSIFICATION

Some definition of the limits of my subject is necessary, and for this purpose three heads may be adopted.

1. Rheumatoid Arthritis.—This is a crippling disease affecting many joints, predominantly those of the extremities, and varying in the acuteness; in some cases it is mildly pyrexial and rapidly progressive; in others apyrexial and chronic.

2. Metabolic Arthritis.—The two chief forms are: (a) climacteric arthritis, which mainly affects the knee joints of women at the menopause; and (b) gout, which is outside our present subject.

3. Osteo-arthritis.—This is a chronic disease of later years, degenerative in character, which may be limited to one joint, and never attacks many unless an infective or metabolic factor is also present. It usually involves large joints and is commoner in men. Climacteric arthritis, if untreated, will develop into osteo-arthritis, and some clinicians hold that malum coxae senile is climacteric in nature.

The microbe most commonly found in septic foci associated with arthritis is the strain of streptococcus termed "viridans" from the greenish color of its growth on some media. It must be noted, however, that some workers regard a staphylococcus allied to, if not identical with, the common epidermal coccus as the more common cause of rheumatoid arthritis, and the streptococcus as causing osteo-arthritis; while others incriminate the Bacillus coli and other intestinal flora. These conflicting views, associated with the fact that all microbes accused of causing non-specific arthritis may be met with in normal individuals, suggest that the infecting agent is more or less universal, but becomes pathogenic only in special circumstances.

VACCINES

The vaccine used may be made from a septic focus found in the patient and thus be autogenous, or it may be a mixture of a number of strains from different cases. While the autogenous vaccine is generally preferred, some find better results from mixed stock vaccines.

The initial dose must always be small and the effect carefully watched.

Since physical methods of treatment may cause auto-inoculation it is better to omit them on the day of inoculation and the two following days. The question of an autogenous or stock vaccine is of less inportance than care in dosage and administration.

PHYSICAL METHODS OF TREATMENT

These methods are of great importance in the treatment of arthritis, but vary widely in their efficacy and in their suitability for any particular case. They are designed to improve the general health and thus to raise immunity both by direct action and indirectly by causing auto-inoculation to relieve pain; to reduce swelling; and to correct deformity, etc. They comprise the various forms of hydrotherapy, massage, electricity, heat, light, etc.

HYDROTHERAPY

Hydrotherapy might with advantage be employed to a much greater extent in ordinary practice. For example, baths may be given at home, though ordinary water will not by any means produce the same result as suitable mineral waters. The soothing effect of a bath about body temperature for ten or fifteen minutes is well known. At a higher temperature it will dilate the capillaries and improve the circulation, which is a matter of much importance owing to the capillary stasis in and around arthritic joints and to the cold extremities and general sluggishness of the circulation in such cases. The cautious application of cold water by means of a sponge at the end of such baths will, by contracting the arterioles, add a stimulating and tonic effect. Rest in bed should follow, when relaxation will take place and the tissues again be flushed with blood. Precision in adapting the temperature, duration and frequency of such baths, and the amount of rest, will be essential if the best results are to be obtained.

Similarly, local baths will be useful, and especially the contrast bath. This is given with two basins or tubs, one containing hot water and the other cold. The limb to be treated is immersed in each alternately. The details must be varied to suit the case, but useful temperatures are 50° for the cold and 100°-105° for the hot bath, with immersion in the latter for forty to sixty seconds followed by ten to twenty seconds in the former; this may be repeated five to ten times. I have found this a very useful procedure for the hands and feet. Vapour baths are also easily given at home, and may be used alone or as a preliminary to the immersion bath. At the spas these methods are enhanced by the nature of the mineral water, and by douches, packs, and massage in the water.

HEAT

Heat may be applied generally by vapour baths or by radiant heat apparatus, which is available in many large towns. Such treatment must be employed with great caution, if at all, in rheumatoid arthritis, as the patients are already debilitated and may be weakened further; but for climacteric arthritis and osteo-arthritis it will often be found beneficial. Local applications are, however, free from this objection, and may be made by poulties, etc., or by simple apparatus. Infra-red rays, which are the most penetrating, can be applied by various patterns of lamps for electricity, gas, or paraffin, and a portable apparatus of this kind is a very useful addition to the armamentarium of a country practitioner. The effect of such measures is to increase the circulation, and thus to remove toxins and improve the nutrition of the joints. Diathermy, if available, is sometimes of help; it heats the interior rather than the exterior of the joint or limb if skilfully administered, but except for osteo-arthritis—more particularly of the hip—I find it less useful than other methods I have referred to.

IONIZATION

This is also a method which may readily be employed in private practice, and it is of great value in the relief of pain and stiffness of the joints. Many substances have been tried, but the best are salicylate of soda for the relief of pain, and potassium iodide, or chlorine ions in the form of "T. C. P.", for effusion into the joints or tendon sheaths or for periarticular thickening. It is most effective in the wrists, knees, and shoulders, the hip being too deeply seated to be reached by this method.

How far the effect is due to the actual ions of the drugs applied, and how far to the action of the current on the tissues and tissue fluids, is open to question, but I think there is no doubt that the latter is important. The negative electrode is the active one with the drugs mentioned, and should be applied with as large a pad as is convenient for the joint under treatment, with the positive over a pad at a distance or in an arm or leg bath of weak saline.

MASSAGE

Massage is a method of treatment often abused. In arthritis its application should generally be limited to the muscles, to restore tone and maintain circulation. Where there is any active inflammation in a joint it is futile to expect to improve the wasted muscles by this means, and rest is indicated till the inflammation has subsided.

REST

Rest is one of the most important points, though it may seem surprising to regard it as a method of physical treatment. During the acutely painful inflammatory stage, a joint should be kept at rest and, if necessary, light splints applied to prevent the development of deformities. In dealing with painful knee joints, especially those with a tendency to flexion, which may easily go on to more or less posterior subluxation, weight extension with rest in bed may be necessary for a time.

MOVEMENTS

Movements are another important part of treatment. They may be active or passive, but the former are generally to be preferred, and may be started as soon as active inflammation has subsided. An increase of pain after the movement, or a lessened mobility, is an indication for further rest; such symptoms will often be associated with some degree of auto-inoculation and consequently general symptoms; pain at night may be due to over-exercise during the day. In carrying out movements of the knee, elbow, and wrist, particularly, attention should be given to securing extension, since it is possible to obtain an apparent greater range of movement and to find that this is due to increased flexion only, while extension is lessened; in such a case further rest, combined with suitable splinting to correct the tendency, may be indicated. Forced movement with or without anesthesia, may be required in later stages to break down adhesions and to restore mobility, but must on no account be attempted until all signs of active mischief have subsided.

COUNTER-IRRITATION

Counter-irritation may be applied locally or at a distant point along the spine or nerve trunks. The latter method has had enthusiastic exponents and is sometimes useful, though how it acts is less easily explained. Bier's bandaging, producing congestion of the distal portion of the limb, is sometimes beneficial—if maintained for half an hour or an hour, there is generally a subsequent small rise of temperature, suggesting that it causes a slight auto-inoculation.

DIET

Diet is a subject upon which there is a great diversity of opinion, and error is extremely prevalent, especially among patients' friends and the popular press. In rheumatoid conditions the first essential is an adequate diet of simple digestible food, and there is no justification for forbidding any article of food which the patient finds easy of digestion and to which there is no idiosyncrasy. The question of idiosyncrasy is important, and careful inquiry should be made. Some patients seem to suffer more pain, etc., after articles of food termed "acid"—though these effects are more usual in fibrositis than in arthritis. Others do well on them, and stout, for example, is usually well borne and found beneficial in asthenic subjects of arthritis. No general rule can be laid down. If there is a tendency to put on weight, as in climacteric arthritis and osteo-arthritis, carbo-hydrates must be kept within limits.

CONSTIPATION

In many cases constipation is probably a contributory factor in the production of arthritis. The long retention of putrefactive matter in the colon leads to irritation of the epithelial lining, reducing its protective functions and facilitating absorption of toxins which tend to lessen tissue resistance. It is therefore essential to treat it by attention to diet and by inculcating regular habits.

When constipation has become chronic or there is clear evidence of toxic absorption, undue fermentation, etc., lavage of the colon is often helpful if not carried too far. It should be given by means of a douche can and with a pressure never exceeding two feet, the quantity of fluid injected being usually one and a half to two pints. The technic is described elsewhere and need not detain us now. Simple saline solution or a very weak permanganate are the most useful fluids for injection. From three to six treatments on alternate days should suffice in one course, and may be repeated after an interval.

DRUGS

I have left this part of the subject till the last, the place it should always occupy in the doctor's mind when called on to treat a case of arthritis, though the patient is apt to put it first and foremost. A patient whose arthritis is being treated chiefly or entirely by drugs is a reproach to his physician. This is not to say drugs should not be employed in their proper place, but they have no specific action in these diseases.

Fibrositis and Muscular Rheumatism. Abst. in Jour. A. M. A., 100:16:1295, April 22, 1933, from Practitioner, London, 130:29, (Jan.) 1933.

Buckley considers that spa treatment is perhaps the most effective of all measures in chronic muscular rheumatism. The regimen of rest and regulated mode of life with the skilled use of baths, massage and douches will often clear up the most obstinate cases when all other methods have failed. Colonic lavage, which is a feature in many spas, is of great value, whether or not constipation is a factor in the case. Whether the spa to be selected is of the thermal radioactive, the sulphur, or the saline group will be largely determined by the general constitutional type and also the wishes of the patient. There are definite advantages claimed for every kind of spa, and sometimes one succeeds where another fails.

Symposium on Acute Burns.

SURGICAL CARE

R. K. Ghormley, M.D., Section on Orthopedic Surgery, Proc. Staff Meet. Mayo Clinic, 8:8:126, Feb. 22, 1933.

The acute burn is always a surgical emergency. Only in cases of severe shock should treatment be delayed, and in some of these it may be wise to start treatment. Since Davidson's report in 1925 on the use of tannic acid, the results of surgical treatment of burns has been more satisfactory. The following accessories are necessary for the treatment:

A bed, preferably in a hospital, sterile sheets, sterile scissors and forceps, an aqueous solution of tannic acid,

2.5 to 5 per cent, an atomizer, cradles of lights, and if possible a special nurse.

The patient is put to bed, the dead skin is removed quickly with the scissors and forceps, and the solution of tannic acid is applied by means of a spray. Cradles of lights are put over the bed, and the temperature of the room is kept at a little more than body temperature. The cradle of lights is covered with sterile sheets to prevent circulation of air. If some form of ointment has been put on the burns before the patient is brought to the hospital it is removed; to do this solvents are sometimes necessary. The procedure is very painful and the patient may require morphine or even an anesthetic. Conditions are more favorable if dressings have not been applied, unless they are dry and sterile.

The degree of the burns is of little significance at this stage. Burns are designated as first, second and third degree, but it is difficult at first to determine the degree; the important thing is to start treatment and a few days later to determine the degree of the burn. The atomizer is convenient in removing the gauze dressings, and its use lessens pain. Spraying as often as every half hour or from two to four hours if necessary is carried out. By the end of five to six hours a definite crust will have formed, and by the end of twenty-four hours it will be well established, then any area in which exudation takes place is sprayed. If blebs form they are punctured and the denuded areas sprayed. During the first few days marked edema develops and causes a good deal of tension under the skin and care must be taken to see that no constricting bands of crusts are present. Such bands are cut through with a sterile scissors, the wound is watched to see if infection develops, and if it does, the crusts are removed in the area affected, and some dressing, such as ambrine or vaseline gauze is applied; the latter is used at the Clinic. If there is no infection, the crusts are not removed until they loosen; the crusts curl up around the margins and can be removed by trimming with scissors. The less the underlying skin is injured the less scar tissue will develop. In the later stages after the tannic acid crusts have been removed, remaining denuded areas are treated first to clear any infection present, then pinch grafts are applied.

Direct Application of the Ultraviolet Ray to the Genito-urinary System.—Preliminary Report. Samuel Lubash, M.D., F. A. C. S., New York City, in Am. J. Surg., XX:1:153, April, 1933.

Not unmindful of the fact that it is an innovation, we present a method whereby the ultraviolet ray can be applied directly to any part of the genito-urinary system. For this very reason we should like at the outset to make it quite clear that we do not attempt to draw any conclusions at this time, but would rather allow the future to evaluate the benefits of this ray by the results that will be accumulated.

APPARATUS

A quartz bulb small enough to allow for its passage through the cystoscope and yet large enough to obtain sufficient ultraviolet radiation when completed and attached to a specially devised high frequency apparatus. The completion of this electrode merely consists in attaching a number 9 F. silk woven ureteral catheter, through which is passed a piece of copper wire, which has attached to its proximal end the quartz bulb containing mercury vapor and to its distal end a terminal. The bulb can be made by varying sizes and shapes depending on what its purpose shall be. To this completed arrangement we shall temporarily give the name of Internal Utraviolet Electrode for want of a better term.

APPLICATIONS

If proved successful its field of usefulness may be wide. Its possibilities in various other systems of the body where application is feasible are numerous. For our purposes for the time being we shall attempt to formulate some conclusions after much work in tuberculosis of the bladder, ureter and kidney, before and after surgical interference, as well as its possibilities in tuberculous sinus tracts.

Progress in Dermatology. Harvey P. Towle, M.D., Consultant in Dermatology, Massachusetts General Hospital, and Jacob Grund, M.D., Assistant Dermatologist, Department of Dermatology and Syphilology, Massachusetts Memorial Hospitals, in New Engand J. M., 208:7:374, Feb. 16, 1933.

IRRADIATION

In view of the claims made by manufacturers for ultraviolet light it is well to give the summary of what the Council on Physical Therapy has proved regarding light therapy (J. A. M. A., 98:400, Jan. 30, 1932). We, therefore, quote verbatim: "The evidence available January, 1932, indicates that ultraviolet rays have a prophylactic and curative effect on rickets, infantile tetany and spasmophilia and osteomalacia.

"Prenatal irradiation of the mother, and also irradiation of the nursing mother, appear to have a definite preventive influence on rickets. This, however, requires general irradiation of the nude body; mere exposure of the head and face could not be expected to yield such a result.

"Irradiation may also exert a beneficial action on other disorders of calcium metabolism, but the limits of such action, the conditions under which it may be produced, and the specific influence of the rays have not yet been fully explored and specified. Exposures of the lesions of erysipelas and a wide area of surrounding tissue has been shown to have a favorable effect on such lesions.

"The benefit derived by patients suffering from tuberculosis of the bones, articulations, peritoneum, intestine, larynx and lymph nodes when exposed to natural sunlight or to the rays emitted by certain artificial sources of radiation cannot be doubted, but the precise role of ultraviolet rays in such action has not been clearly determined. It is probable that visible radiation and the conditions of the atmosphere share in such action.

"As far as normal persons are concerned, the claim that exposure to ultraviolet rays increases or improves the tone of the tissues or of the body as a whole, stimulates metabolism or tends to prevent colds has not been conclusively substantiated.

"Among the diseases of the skin, on lupus vulgaris alone can ultraviolet rays be said to act specifically, and this only when the disease is treated strictly on the Finsen principle. In other dermatoses (scrofuloderma, erythema induratum, psoriasis, pustular folliculitis, indolent ulcers, furunculosis, acne vulgaris, angioma serpiginosum, parapsoriasis, pityriasis rosea) local or general exposure to ultraviolet radiation may have a favorable action, but the improvement that may result cannot be regarded as a specific effect of the rays. In some cutaneous disorders (eczema, psoriasis, lupus erythematosus, herpes simplex, crythema solare perstans, xeroderma pigmentosum, freckles, atrophy, keratoses, prematurely senile skin) exposure to such rays may cause an exacerbation, provoke an attack, or produce other injurious effects."

Herlitz, Jundell and Wahlgren contribute food for thought in their article on Malignant Neoplasms caused by Ultraviolet Irradiation of White Mice (Acta Paediat. 10:321, 1931). Three groups of animals were used in

the experiment. One group was used as a control. The other two were exposed to ultraviolet rays under various conditions. It was found that, when the skin was poorly protected, hyperkeratoses, epithelial hyperplasias and, in some instances, ulcerations developed. Continuous exposure from 10 or 20 to 30 weeks caused carcinomatous, sometimes sarcomatous neoplasms. In some animals there were metastases to the lymph nodes and lungs. No tumors were found in the control group.

The Reaction of Individual Bacteria to Irradiation with Ultra-Violet Light. Science, 77:1997:350, April 7, 1933.

Students of the effect of ultra-violet light on bacteria have commonly accepted absence of multiplication, tested by clouding of broth or by colony formation, as the criterion of bactericidal action. This is a convenient but arbitrary endpoint, for "death" is not necessarily coincident with failure to multiply.

Observations on single organisms (B. coli communis) in the first hours after irradiation with measured monochromatic light, 2377 to 3022, show that there is a wide reaction zone between the behavior of cells which are not visibly affected and these which seem to be killed outright by the exposure. Single organisms which apparently have been unaffected grow and divide regularly on the surface of nutrient agar, producing typical colonies of normal-looking bacteria that ultimately coalesce into a confluent growth. Organisms which are exposed to quickly lethal doses show no increase in size and no cell division, but soon lose their high refractility, become beaded or irregularly refractile and degenerate into ghosts or shadows which are undoubtedly dead. In the intermediate zone between these two extremes the irradiated organisms present a remarkable picture. They increase in size, especially in length, without apparent inhibition, but do not divide when the normal adult stage is reached; so that long filaments of clear, highly refractile protoplasm are formed that look like spaghetti and may attain measured lengths of 50 to 150 microns. The transverse diameter is 1 to 3 times that of normal bacteria. These long forms are actively motile in a fluid medium, progressing with a sinuous motion, or drilling back and forth like spirochadtes. In 2 to 4 hours at 37.5°C the cells reach a limit of individual growth, forming long rafts of parallel filaments on an agar surface. Then cell division or degenerative changes begin. (1) The long cells may undergo a gradual degeneration, with loss of hyaline refractility, beading and ghost formation. (2) They may divide by cross fission into a number of large or small units, which then degenerate without further growth. (3) One or more normal-looking daughter cells may pinch off at one end and multiply rapidly to colony formation. The rest of the filament follows courses 1 or 2 above. Daughter cells have not been observed to form filaments; the reaction is limited to cells directly exposed to ultra-violet light.

Here is an apparent separation of two coordinate functions commonly essential to life. Cell division is regulated by a mechanism which is much more sensitive to wave-lengths below 3,000 than is the concomitant function of growth. By appropriate exposures the one can be temporarily or permanently suppressed, while the other proceeds for hours without hindrance.

Ultimately, however, a limit is reached, and unless the division mechanism is restored the cell degenerates. A further study of this cell reaction is in progress.

FREDERICK L. GATES, Harvard University.

Studies in Rickets. VI. Comparison of the Development of Rachitic Children in Whom Rickets Was Prevented by Ultra-Violet Irradiation. J. Victor Greenbaum, M.D., and Theodore K. Selkirk, M.D., Cincinnati, Ohio, in Jour. Pediat., II:6:711, June, 1933.

In 1928 we reported before the Section on Pediatrics of the American Medical Association a study of ultraviolet irradiation, in which we found that an exposure of eleven minutes a month, given regularly, was sufficient to protect infants against rickets. The present paper is a study of some of the children of that series at five years of age with special reference to the effects of the presence or absence of infantile rickets on their subsequent development.

There is practically no difference in the average weights and heights of the two groups at the present time.

The estimation of the state of nutrition, which is based on both the height-weight relationship and the clinical impression, gives a higher incidence of mild nutrition in the rickets group.

There were no pronounced bony abnormalities in either group. One child in the nonrickets group showed a moderate defect, that of flat feet. Knock knees of a mild character occurred in both groups. Pigeon breast occurred only in the rachitic group but was of slight degree.

Abdominal findings were about the same in both groups.

It had not been expected that there would be much difference between the groups in the deciduous teeth since these are calcified mainly during prenatal life, but, as a matter of fact, it was found that the main difference between the two groups lay in the teeth. There were thirty-one carious molars or canines in the ten children of the rickets group as compared with twenty-five in the twelve children in the nonrickets groups. All of the children of the rickets group showed caries, while five of the nonrickets group had escaped caries. It may be argued that this difference was dependent more on the care of the children since infancy than on the presence of rickets during infancy since there was found a greater incidence of caries among those children showing malnutrition than among those whose nutrition was satisfactory. Similar findings had been observed by us in another study. Apparently the contagious diseases of these children bore no definite relation to the incidence of caries. The permanent teeth had erupted in only a few instances and showed no differences between the groups.

The noteworthy finding on comparing the two groups is that there is very little difference between them. Should sebsequent investigations demonstrate the same finding, the conclusion would be justified that rickets in infancy has but little effect on the later development of children. The importance of ascertaining whether this is true is obvious and justifies the presentation of other carefully controlled studies similar to the present one.

However, in view of the lowered resistance to infection during infancy, the possibility of tetany and the other commonly accepted dangers of rickets in the acute and healing stages, the desirability of the prevention of this disorder in infancy should not be minimized.

Progress in Otolaryngology. Summaries of the bibliographic material available in the field of otolaryngology.

LARYNGEAL TUBERCULOSIS

George B. Wood, M.D., Philadelphia, Penna., in Arch. Otolaryng., 17:5:700, May, 1933.

Cemach (Strahlentherapie 43:547, 1932) described a new lamp which is built for the special purpose of getting the ultraviolet rays into the larynx. It is a high pressure

mercury vapor arc lamp about 35 mm. long and 10 by 16 mm. broad in oval section. The arc burns in a U-shaped quartz tube, 1 mm. in width. This tube is surrounded by a quartz mantle, and there is a space between the mantle and the lamp through which water circulates for cooling purposes. The mercury vapor arc will burn in any position because of a considerable internal vapor pressure which prevents the thin mercury columns from flowing together when the position of the lamp is changed. The quartz mantle is bent in a circle over its entire length, so that the apparatus resembles a laryngeal instrument. One end is covered with a metal cylinder which is attached to the hand piece; the other end of the quartz mantle, that is, the portion that is to be introduced into the larynx is covered with a gold sheath which prevents lateral disbursement of the rays. The rays pass out through a window at the terminal end of the lamp, at which point a prism directs the light slightly backward. With the lamp in the proper position, the rays are directed against the ventricular bands and vocal cords from the anterior commisure back to the arytenoids. Usually, other portions of the larynx and even the epiglottis can be irradiated by changing the position of the lamp.

Cemach has also constructed gold covers with side windows which permit lateral irradiation. The lamp is built to run on the direct current and if an alternating current is used, a converter must be employed instead of a rheostat. The cooling water is supplied to the lamp by two small rubber tubes, one, the intake, attached to the water supply, and the other placed over a bucket so that the operator can hear the splash of the water and thus be sure that there is no cessation of circulation during application of the lamp. Two tongue depressors are furnished with the lamp, one to expose the hypopharynx, and the other with the end so shaped that the epiglottis can be pulled forward. After cocainization of the throat the tongue is forced downward and forward by the depressor, and the lamp introduced. While the lamp in the right hand is being introduced by direct vision, the point is carried behind the epiglottis and down into the larynx until the light almost disappears from the throat. The action of this lamp is intensive, and tissues which come in contact with the window will show erythema in from ten to twenty seconds, and vesicles in from twenty to thirty seconds. At a distance of a few millimeters, an application of from forty to fifty seconds will produce erythema. The reddening of the area irradiated lasts for two or three days and should be carefully watched in order to guide further treatment. Treatments should be continued at weekly intervals with increasing doses up to a hundred seconds, and if this dosage is well borne and there is a distinct improvement in the general as well as the local condition, the dosage can be gradually increased to two hundred and forty seconds. When there is a marked reaction, the dosage should not be increased and sometimes should be reduced.

Cemach found that ulcerative processes show the greatest improvement after this treatment, and that the lesions with a fibrotic basis also react well. Exudative lesions take a longer time to react, and if there is much surrounding edema, they may be very refractory. Marked infiltration and tuberculomas frequently require months of treatment; this is especially true of the epithelial hypertrophies of the posterior commissure. In this type of case, Cemach uses the cautery, which in the form of ignipunctures is especially applicable for the destruction of tuberculomas. For prolapse of the ventricle he uses a bent cautery knife, the point of which can be placed under the false vocal cord into the ventricle.

It would seem that the Cemach lamp is the best instrument so far devised for getting the ultraviolet rays into the larynx, and its intense action, which requires a very short application, is of great advantage.

Vandevere reported favorable results from the use of the Verba laryngeal mirror, which the patient uses for reflecting sun rays into his own throat. He said, however, that application of the electric cautery is far superior to any other method for treating active tuberculosis of the larynx.

Sir St. Clair Thomson recently published the results of his experience with the use of general irradiation as a therapeutic measure for laryngeal tuberculosis. He employed carbon arc lamps obtained from Copenhagen which are similar to those used in the Finsen Institute. He treated only selected patients and obtained 75 per cent success. He said, however, that these statistics are misleading, as all of the patients were regarded as favorable as to both local and general conditions, and that some patients had recurrences which healed without treatment with ultraviolet rays. In eleven cases in which there was no improvement the lesions were healed with the galvanocautery.

Sir St. Clair Thomson stated in his conclusions that "In thirty-two favorable cases there were no striking evidences of benefit from light treatment; in only two or three might some help from it be claimed. Nor can it be said that healing of laryngeal tuberculosis was hastened, or that the course of light baths in any way rendered subsequent cure by the cautery more rapid or more certain."

A Note On Tuberculosis of the Larynx and Light Treatment. A. J. Cemach, Vienna, in The J. Laryng. & Otol., xlviii:5:326, May, 1933.

Sir St. Clair Thomson (British Medical Journal, November 19, 1932) has investigated the treatment of laryngeal tuberculosis by means of general irradiation with carbon arc light on the lines laid down and strenuously advocated by Dr. Strandberg of the Finsen Institute in Copenhagen. The investigation was made in a most careful and scrupulous manner on a sufficient number of selected cases, so that Sir. St. Clair Thomson is undoubtedly entitled to pronounce judgment on the utility of this method.

His verdict proved completely negative. Sir St. Clair Thomson expresses "much disappointment" at the result of his investigation. This has not surprised me, as I have had the same experience, and as far back as 1926 I also expressed my negative verdict regarding the Strandberg therapy at the Hamberg Congress of German Nose, Throat and Ear specialists. (Zeitsch. f. Hale-Nasen-Ohrenheilk. Vol. 15, Nos. 2-4. Kongress bericht, p. 132.)

While previous developments justify the conclusion that general light baths are inadequate in laryngeal tuberculosis, light as a local healing factor has proved its value in various directions. We know the effects of Finsen light on lupus, and of ultraviolet radiation generally on tubercular efforescences of the skin and membranes. It was therefore a justifiable assumption that a similar effect could be achieved in the larynx also, provided that direct application of suitable radiation could be contrived in a practical manner. This was the inducement which led me to go over from general irradiation to local therapy in treating laryngeal tuberculosis.

This apparatus consists of a small quartz lamp of which I attach an illustration. Being made in the form of a laryngoscope, it can be easily introduced into the larynx. The technique is so simple that it can be readily carried out by any doctor, even without special experi-

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ence in laryngology. (Details are given in a paper, "Neuer Weg der Lichterapie der Kehlkopftuberculose," Strahlentherapie, Vol. 43.)

No pretence is made that local light therapy constitutes a complete method of treatment, although in many cases, even when applied alone, it can overcome laryngeal tuberculosis. It cannot replace systematic sanatorium treatment which aims at improving the general immunity. Neither does it take the place of other forms of local treatment such as cauterization. Every form of therapy has its indications. The domain of quartz light therapy is found in ulcerated processes; for this form of the disease we have no better weapon than light. When we have been able to inhibit the ulcerative destruction of tissue by means of irradiation, then nothing prevents us from removing infiltrations by subsequent applications of the cautery. These infiltrations will be torpid, inclined to calcify, and consequently refractory to the action of the light. One form of therapy thus assists and supplements the other. Sanatorium treatment, even when combined with cauterization, has failed to produce a satisfactory result. The desired result can, however, be achieved very frequently by the combination of sanatorium treatment and cauterization, with local light therapy.

Experiments on Diabetes with Diathermy of the Pancreas. Sec. of Foreign Letters, Jour. A. M. A., 100:13:1052, April 1, 1933.

After long experimentation, Prof. Alexander Koranyi and Dr. Joltan Rausch succeeded in reducing the blood sugar in healthy subjects and also in diabetic patients by means of diathermy of the pancreas. The degree of reduction is slight as yet but is nevertheless encouraging. In cases of mild diabetes, the systematic use of diathermy of the pancreas with sittings of half an hour to an hour before the principal meals improved carbohydrate tolerance. In rather severe cases of diabetes, diathermy of the pancreas had not the slightest result, so that Professor Koranyi refrained from repeating the experiments on such patients. Under the action of diathermy, the insulin production of the pancreas could be increased, and, hand in hand with this, the glycolytic power of the blood, Koranyi and Rausch concluded that, if there exists a sufficient quantity of interstitial cells, diathermy of the pancreas is likely to act favorably on diabetes and on all its symptoms, while if the reduction of the islands of Langerhans is of a great degree, caution must be observed, for there is the possibility of the exhaustion of the secretory function.

Dehydration in Heat Exhaustion and in Fatigue. C. Van Zwalenburg, M.D., Riverside, in Calif. & West. Med., XXXVIII:5:354, May, 1933.

CONTROL OF TEMPERATURE

In the regulation of the temperature of the body the most important factor is the water balance. Normally this goes on automatically and the loss of water is supplied through the sense of thirst, which calls for more water when the supply runs low. This automatic response to the sense of thirst normally suffices to fill the storage reservoir throughout normal animal life. However, it does become necessary often in the treatment of disease to supplement artificially the amount of water intake to maintain an adequate supply. The sense of thirst is sometimes insufficient or may be ignored, or there may be inability to secure water, to drink it, or retain it.

The normal metabolism of the body—the combustion of food substances by the oxygen taken in—constantly produces heat in the body, and when we remember that the normal temperature of the body is 98½ degrees Fahrenheit it becomes obvious that very adequate mechanism is required to regulate the amount of heat produced and the amount of heat lost. This process is looked upon as very complicated, but many of the factors are very simple, the most important one being the control of the circulation of the skin. Cold contracts and heat dilates. Vasomotor control and heat-regulating apparatus have been sought for and found in the medulla, but the principal ordinary control is the direct effect of heat upon the skin. Heat causes dilation of the blood vessels and cold causes contraction, thus regulating the loss of heat.

HEAT LOSS

Heat is lost from the body by direct radiation, convection, conduction, and evaporation; but in the presence of excessive heat the greatest dependence is upon evaporation from the lungs and skin. Smith found that under average conditions the heat loss by radiation, conduction and convection from the skin is two or three times the amount lost by evaporation. Wiley and Newburgh found that under conditions of high temperatures the amount lost by evaporation with sweating is very much more, and, obviously, is often enormous.

EVAPORATION

All investigators emphasize the fact that, in the final analysis, lowering of body temperature in excessive heat is dependent upon the evaporation of water from its surface. Water passing from a liquid to a gas (vapor) takes up heat from its environment. This heat is taken from the body, thereby cooling it. It is the same process which cools water in the Spanish olla. The dry desert wind, passing over the moist porous jar, evaporates water from its walls, and the heat of evaporation coming from the jar and its contents cools the water in it.

Haldane says: "Evaporation permits the body to tolerate temperatures which would otherwise be totally incompatible with life." In the absence of evaporation, he places the upper limit of safety at 88 degrees Fahrenheit if at rest; at 78 degrees Fahrenheit if working in still atmosphere. Above these temperatures some evaporation is essential. When the environmental temperature reaches blood heat, evaporation must play the sole role of stabilization.

PERSPIRATION—WATER LOSS

The loss of heat being so largely the result of evaporation, the amount of water lost by perspiration keeps pace with the need of lowering the temperature of the body, and an estimate of the amount of water lost by sweat becomes significant. Many careful estimates have been made, and the amounts are often enormous. Haldane reports the following from an account by Dr. A. E. Boycott on visiting mines in England: "As you know, the men are reported to wet the drill holes by pouring the sweat out of their boots." The amounts recorded under various conditions of temperature and humidity range from one litre an hour in extreme conditions to forty grams per hour in ordinary room temperature.

CHLORID LOSS

With profuse perspiration there is excessive loss of chlorids, which are so necessary in the metabolism of the body. This problem has had careful study and the necessity of replenishing these chlorids in all forms of dehydration has been properly emphasized.

MECHANICS OF EXHAUSTION

The obvious result of this excessive loss of water is

to lower mechanically the blood volume, producing a condition almost identical to that following hemorrhage or surgical shock. The sense of exhaustion is due to the difficulty of the circulation maintaining an adequate blood pressure in the nerve centers. We know that unconsciousness follows a sufficient drop in blood pressure. The sense of well being depends upon constant blood pressure. Exhaustion is one of the first evidences of loss of blood, faintness, deprivation of food and drink, and shock, inadequate volume in the blood vessels. Fatigue for the same reason is in large part a sense of this approaching exhaustion from lack of fluid in the blood vessels. As a demonstration that this loss of water is the cause of fatigue and a sense of exhaustion I have with great satisfaction made the following simple test. After excessive perspiration following eighteen holes of golf on a hot day or a strenuous two or three hours in the operating room, I have repeatedly taken a couple of glasses of water, reclined on a couch for ten minutes until the water was absorbed and have then been able to slip into the continued duties of the day, feeling entirely rejuvenated and fit to go on. The fatigue is overcome by the simple process of filling the blood vessels after the supply there and in the storage reservoir has run low.

CYANOSIS

During the later stages of heat exhaustion there is usually cyanosis, which often persists after death. During an aggravated heat spell in New York in which the victims were too numerous for the beds in the New York Hospital, deaths were so numerous that funerals were delayed, and a large number of corpses accumulated. A casual look by a visitor brought the report, "why, they are all negroes." It was the cyanosis which persisted postmortem.

PATHOLOGY

The pathology of heat exhaustion is that of dehydration. Wall and Wakefield: "The major change was rigid contraction of the left ventricle, and venous congestion of all the veins in the body." Prudden and Delafield refer to H. C. Wood, Jr., calling attention to the rigid condition of the wall of the heart. Osler and McCrae: "The arteries seem to empty themselves and send the blood to the periphery.

CONCLUSIONS

We have reviewed the literature carrying the growing accumulation of evidence that dehydration is the important factor in heat exhaustion, and have illustrated the application of this principle.

The study of fatigue shows that dehydration is a large factor, especially in the face of copious perspiration.

In acute heat prostration, intravenous use of water, saline, or dextrose, is a life-saving procedure.

An abundant, convenient, and palatable supply of water should be a first concern for all workers in hot, humid environment, brain workers as well as muscle workers.

Most people need the advice: Drink more water.

Temperature Changes and Their Effects on the Circulation. Henry C. Bazett, M.D., Philadelphia, Pa., in Northwest Med., XXXII:5:173, May, 1933.

A mild exposure to warmth would, therefore, appear to decrease the load on the heart to a minimum, while any change in either direction would raise it. A rise of temperature above the optimum is apt to be more serious than a fall. However, any exact estimate of the real level for minimum work for the heart must await investigation with more accurate methods of measuring blood pressure. It should be noted that in Grollman's experiments the minimum metabolism occurred at the same temperature (30 degrees C., 80 degrees F. with low humidity) as that estimated for minimum work for the heart. This temperature for minimal metabolism varies with the air humidity. It is probably one which gives surface temperatures on the exposed skin of about 35 degrees C (95 degrees F) and could be duplicated by warm baths at 35 degrees to 36 degrees C (95 to 97 degrees F).

Exposure to high temperatures is desirable, even in some cases with circulatory disorders, since it may prove a useful means of ridding the body of fluid through sweating, even though the work of the heart may be temporarily increased. Heat is usually applied in such cases by radiant heat. It is not generally recognized that sweating continues just as rapidly in a warm bath and that baths are in many ways preferable. When a bath is employed, however, care must be taken to prevent too rapid a rise of body temperature and the bath should not be much above the body temperature level. The temperature of the patient should not be allowed to rise more rapidly than 1 degree to 2 degrees per hour unless from previous experience the subject is known to stand such procedures well.

The effects produced by a general increase of body temperature appear to be similar, whether hot air, hot baths, diathermy or the condensor discharges of the short wave radiotherm are used. Possibly some quantitative differences may be observed with heating by high voltage diathermy machines and the radiotherm as compared with the other methods, since the heating is in these cases probably more uniform and less associated with sensations of warmth from the skin, and consequent reflex changes. In fact Wiggers and Orias have reported that the blood pressure changes in anesthetized dogs are very different, when they are warmed by a radiotherm instead of by hot baths. In the latter case there is a marked fall of blood pressure not seen in the former. However, some other factor (e.g. rate of rise of body temperature or depth of anesthesia) may be concerned, for clinicians using the radiotherm in man have reported decreases in blood pressure comparable to those observed with other means of heating.

The dangers of artificial pyrexia appear to lie in three directions: (1) too high a brain temperature. According to the method and point of application of heat the brain temperature can probably rise either more rapidly or more slowly than that of the rectum; (2) A marked hypernea reaction with lowered carbon dioxide tension and alkalosis. According to Davies and Holmes this may itself lead to circulatory failure—though an increase in temperature makes the blood more acid. The respiratory reaction, that occurs when the whole body is heated, more than compensates for it, and the blood is rendered more alkaline; (3) Desiccation through loss of fluid in sweat, and circulatory failure through insufficient filling of the heart.

The first of these may be combated by cooling the head, provided that a rise in brain temperature is not a necessary part of the treatment. The hair makes a good insulation. Local cooling of any part is difficult unless the veins accompanying the arteries are full of cooled blood. Probably a constant stream of moderately cold water (say about 70 degrees F) applied to the head and neck and as far as possible also to the scalp.

The second danger may be avoided in most subjects, if the rate of heating is kept slow, for the hyperpnea is

more related to the rate of rise of body temperature than to the actual temperature reached. But if it occurs and seems to be a serious factor, the administration of a gas mixture containing carbon dioxide (e.g. the mixture of 95 per cent oxygen and 5 per cent carbon dioxide used in anesthesia) will immensely improve the condition and comfort of the subject.

The third danger may be avoided by forcing fluid intake. Since the loss of sweat implies the loss of an approximately 0.2 per cent solution of salt, it has been found that in all such exposures to heat (including the working of subjects in hot mines or stoke-holds) much better results are obtained if the subject substitutes for water a 0.2 per cent solution of common salt. Circulatory failure from desiccation can usually be readily recognized. It is associated with a restlessness on the part of the subject entirely comparable to that seen after a large hemorrhage, and the venous pressure is low.

Carbon Dioxide Baths. Abst. in Jour. A.M.A., 100: 16:1296, April 22, 1933, from Practitioner, London, 130:90 (Jan.) 1933.

Baumstark and Deglmann point out that auxiliary physical methods of the treatment of cardiac and circulatory disorders have been widely developed during the past twenty years or so and, in the aggregate, are often more important and more effective than drugs. Among these measures are rest in bed, suitable variation between rest and light work, and limitation of food and drink; and the former practice of venesection has come into favor again. But first among the methods of physical treatment known both to the medical attendant and to patients, in Germany at least, is the carbon dioxide bath. The value of these baths has long been vigorously discussed, chiefly because their use was mainly empirical, experimental data about their exact action being scanty. A scientific foundation for this form of treatment has now been built up. Although many problems still await solution, knowledge of its scope and limitations has now been so far defined that the mode of action of carbon dioxide baths was sufficiently important to be selected as the main subject of discussion at last year's balneological congress in Germany. In the sixties of the last century, Beneke of Marburg began the treatment of cardiac patients on an extensive scale with the Nauheim springs, which had previously been employed as brine baths for rheumatic and gynecologic conditions; subsequently Schott, Bode and the elder Groedel undertook the first scientific researches on these baths and their action. Nauheim and carbon dioxide treatment soon became well known in "heart cases," but Mackenzie criticized the Nauheim Treatment the results of which he had observed in numerous patients, stating that he had never seen successful results from baths of any description, or observed in patients, who had visited Nauheim any beneficial effects that might not have been achieved by treatment elsewhere. He coined the expression "Nauheim wrecks" for patients who returned from Nauheim in a worse condition than when they went. The reason for his opinion is now clear; he stated that the claims of the spa physicians were contradictory and that there was no individualization of treatment. At that time not only was balneotherapy expected to achieve the impossible but it was also employed in conditions in which it would do far more harm than good. Cardiac conditions, now considered absolutely to contraindicate baths, were at that time the chief field of their use.

Angina Pectoris, Spasmodic or Paroxysmal. John Hay, D.L., M.D., F.R.C.P., (Professor of Medicine, Liverpool University; Senior Physician and Physician to Heart Department, Royal Infirmary, Liverpool) in The Practitioner, CXXX:6:658, June, 1933.

TREATMENT

During an Attack.—It is imperative on the first indication, even if that be no more than a substernal discomfort or some erratic pain known to be the percursor of an attack, that the patient should cease walking or the work of the moment. The pain is a peremptory order to halt. If the pain does not disappear but increases in spite of rest, one or more tablets of trinitrine should be chewed slowly. These may in turn yield no relief, and then the inhalation of amyl nitrite is essential. If the vaso-dilators fail and the pain is intense, there is no drug comparable to morphine.

Every patient learns by experience the special activity or combination of circumstances liable to induce an attack, and this common sense teaches him to avoid them. Certain forms of exercise are more likely to induce pain than others, in some there is a peculiar idiosyncrasy for which there is often no satisfactory explanation. It has been noticed that a form of exercise which is boring is more liable to produce pain. Haste and hurry immediately after a meal, more particularly breakfast, are among the commonest exciting factors, and the distress is greater and more quickly induced if he finds himself in a nipping and an eager air. In fact, some persons are so peculiarly sensitive to sudden changes of temperature that even the chilly atmosphere of a fireless bedroom or the contact with icy sheets precipitates an attack. These factors can be avoided. It is noteworthy that some patients have by experience found that if, when the pain first appears, they persist (though more quietly) in their walking the discomfort subsides, and they are able to continue without distress. They have warmed up to their job and the circulation has adapted itself; they have got their second wind. I see no objection to this if repeated trials have proved that this can be done with impunity. On the whole this feature is favorable. Walking and talking simultaneously is often a combination which induces pain. In others, excitement or irritation are especially dangerous. Such patients must cultivate a philosophic outlook and avoid every individual or environment likely to disturb their equanimity.

General Treatment.—This is based on the recognition that the circulation through the coronaries is defective and that this defect is permanent and irremediable. Reliance, therefore, must be placed on a change in the mode of life rather than on drugs. The advent of anginal pain is a serious indication that the heart is no longer equal to the demands being made on it, and those demands must accordingly be diminished.

Exercise is advisable: the heart muscle must be kept fit. One of the best forms is walking; even golf in the milder cases if the patient is honest with himself and is prepared to cry "halt" if pain appears, though I question whether it is ever advisable for an anginal patient to golf in a wind or on a keen cold day. As the condition advances the amount of exercise which can be indulged in with comfort gradually diminishes. It is hardly necessary to mention that in no circumstances should any sudden or severe physical effort be made. A short rest after each but the lightest meal should be insisted upon, and this is especially important after breakfast when there is often a temptation to hurry off to business.

Diet is important. Meals should be small, the food simple and digestible, and a minimum of fluid taken with the meal. If the patient is obese then the diet should be such as to bring about a slow loss of weight. Over-

weight is a serious and unnecessary handicap to the heart.

In those in whom there is an outstanding mental factor, the result of prolonged overwork, domestic worries, or financial difficulties, massive doses of ammonium bromide are undoubtedly helpful, prescribed in doses of gr. xx, twice or thrice daily; the addition of chloral hydrate gr. x, twice daily, is valuable. This is especially to be recommended at the beginning of treatment when the patient is facing the revision and reorganization of his life and habits. Later, luminal. In cases of undoubted syphilitic infection potassium iodide in full doses should be given and, if possible, mercury by inunction.

Occasionally diathermy diminishes the number and severity of the attacks both in patients with frank hyperpiesia and in those with normal pressures. It is best administered with one electrode placed over the sternum and the other between the shoulders. A suitable dose is from 800 to 1,500 milliamperes for twenty to thirty minutes twice or thrice a week. Special care is necessary after toxic illnesses such as influenza. General tonic treatment and haematinics are then of value. In those rare cases of anginal pain in patients suffering from pernicious anemia, the treatment is that of the anaemia. Shirley Smith states that he has obtained satisfactory results from the use of insulin and glucose in anginal patients, irrespectice of the presence or absence of diabetes. This offers a new line of attack.

In the treatment of angina pectoris, apart from the actual attacks of pain, it cannot be too strongly stressed that it is essential to remodel the manner of life, to delete unnecessary expenditure of energy, and to live within the limitations imposed by the damaged heart. Dependence must not be placed on drugs.

Harm in Eye Exercises and Eye Massage. Queries and Minor Notes, Jour. A. M. A., 100:17:1362, April 29, 1933.

To the Editor:—Is eye exercise, eye massage, and the practice of central fixation by use of the Snellen test card of any value in the treatment of errors of refraction such as myopia and hyperopia? In your opinion would the practice of these have any injurious effects on the human ametropic eye or help produce any anatomic changes, such as detachment of the retina? What is the difference in length of the optical axis of an emmetropic eye and an ametropic eye with a myopia of 1 diopter? Please omit name.—M.D., Indiana.

Answer.—No. Eye exercise, eye massage, and central fixation of the Snellen or any other card are the hooks on which the modern ophthalmic quack impales his victims, aided by the lure of a lot of high-sounding hooey. Such practices cannot influence errors of refraction one iota in any respect, but eye exercises and eye massage can be most destructive in detachment of the retina and certain other conditions. Three diopters of myopia is equivalent to an increase in length of 1 millimeter; hence 1 diopter of myopia indicates an axial difference in length of approximately one-third millimeter.

Experimental Studies in Diathermy Applied to the Eye and Orbit. B. Comparison of thermal effects of diathermy, infra-red radiation and electric heating pad. William F. Moncreiff, M.D., John S. Coulter, M.D., and H. J. Holmquest, B. S. (M.E.), Chicago; in American J. Ophthal., 16:3:193, March, 1933.

DISCUSSION OF EXPERIMENTAL DATA

In considering the rise of temperature attained by comparison of each of the three methods of heat production, it should be borne in mind that each method was applied to the maximum limit of tolerance of the superficial tissues, and that the role of conduction of heat from without inward, or from the surface to the deeper tissues, is of special importance. In the case of diathermy, heat production is greater beneath the surface than on the surface and the role of conduction in the heating of the deeper tissues is a very secondary one, while in the case of radiation with infra-red rays, heat production is primarily within the superficial tissues, with conduction of heat from these to the deeper tissues playing a rôle of greater importance than in the case of diathermy. In the case of the electric resistance heating pad, the greatest concentration of heat is on the skin surface, so that rise of temperature not only in the deeper tissues, but also in the superficial tissues as well, is dependent entirely upon conduction of heat from without inward.

With these facts in mind, we may logically infer that when each of these methods of heat production and application is employed for comparison, up to the maximum tolerance of the skin, the greatest input of energy into the tissues, as well as the greatest tolerance of the skin, will be in the case of diathermy, while radiation with infra-red rays will rank second, and the heating pad third and least both as to energy input and skin tolerance.

The relative efficiency of each of these three methods of heat production in each of the four zones studied is shown in the accompanying tables and graphs. It is at once seen that considerably higher temperatures were produced in each zone by the diathermy current of 600 ma., than by the other methods. No disproportionate high rise of temperature in the cavum oculi was noted in the case of radiation by infra-red rays, or conduction heating by the electric pad, as was observed with the 600 ma. diathermy current. The temperatures produced in the several zones by infra-red radiation show a relatively uniform gradient from without inward, or from anterior to posterior zones, with the exception of a less marked rise in the cavum oculi, just as was found with the diathermy currents of lower intensities.

The maximum temperature rise, only 2.8° C., produced by the heating pad, was in the conjunctiva. Temperature elevations only slightly less marked were produced by the heating pad within the eyeball itself, but the rise of temperature produced near the apex of the orbit was considerably less, only 1.3°C. It may be noted that in each zone the rise of temperature produced by the 600 ma. diathermy current was 3.0°C. or more, in excess of that produced by the heating pad, and that in the anterior zones, the rise produced by infra-red radiation was approximately 2.0°C. in excess of that produced by the heating pad.

Intermittent Claudication. Abst. in Jour. A.M.A., 100:19:1566, May 13, 1933, from Die arztliche Praxis, Vienna, 7:65 (March 15) 1933.

The recognition of intermittent claudication is, according to Schlesinger, usually comparatively simple. The anamnesis reveals that pains, paresthesias, spasms or weakness develop in the course of walking, but that they disappear again following a short rest. If examination of the arteries of the legs of such patients reveals the absence of some or of all typical pulses, the diagnosis is usually definite. Intermittent claudication is the result of arterial spasms and is not a disease entity, but it may develop in the course of every arterial disease or in arteriosclerosis, thrombo-angitis obliterans, traumatic arterial diseases, aneurysms, syphilitic arteritis of the extremities, periarteritis nodosa and acute arteritis. The fact that it is an early sign of threatening gangrene gives intermittent claudication a special importance. By giv-

ing the proper attention to this early sign, it is often possible to prevent or at least postpone the development of gangrene, although there is one form in which this is impossible, but fortunately this form is comparatively rare. The author discusses the pathogenesis of intermittent claudication, giving especial attention to the disturbance of the arterial innervation. He mentions several contributing factors, such as an excessive use of condiments, overexertion, traumas, infections, exposure to cold and particularly nicotine. Observations in several hundred cases convinced him that nearly all patients are smokers and that they are highly susceptible to nicotine. He points out that intermittent claudication is often erroneously diagnosed as flatfoot neuritis, muscular rheumatism, gout, varicose veins and periostitis. The prognosis is not always as unfavorable as is often assumed, for a rational prophylaxis in the form of frequent lukewarm footbaths, proper care of the nails, suitable footwear, and protection against injury, overexertion, heat and cold can prevent gangrene. The author evaluates the various therapeutic measures that have been recommended for intermittent claudication. The fact that the benign form reacts to many medicaments has led to the recommendation of many preparations. Of the various forms of roentgen treatment (irradiation of the vessels, of the lower portion of the spinal column, or of the suprarenals), the first two are occasionally effective. Galvanization and short wave therapy have also been tried, but the author found the latter ineffective. He advises caution in every form of heat application, because angiospasm may result. In evaluating the much disputed sympathectomy, he points out that indiscriminate use has brought it into discredit. He considers it justifiable in cases that are refractory to other measures and in those in which gangrene threatens.

Book Reviews

LIGHT THERAPY: By Frank Hammond Krusen, M.D., Director of the Department of Physical Medicine, Temple University School of Medicine, Philadelphia. Foreword by John A. Kolmer, M.D., Dr. P. H., D. SC., LL.D., Professor of Medicine, Temple University School of Medicine. 186 pages with 33 illustrations. New York: Paul B. Hoeber, Inc., 1933. $3.50 net.

Doctor Krusen has given us a most excellent working manual on the use of light rays—both visible and invisible—in medicine. His hope that "this book will render light therapy more intelligible" has certainly been granted.

The chapters on Physics, Sources of Therapeutic Light, Need for More Accurate Selection of Therapeutic Rays and Physiology will lead particularly to a greater understanding of the application of this valuable agent.

The book is complete with technique as a whole and as applied to various diseases said to be amenable to light therapy. The bibliography is excellent as Dr. Krusen brings forward other research workers.

Again let it be made clear that this book should be a valued member of one's working library.

PHYSICAL THERAPEUTIC TECHNIC: By Frank Butler Granger, A.B., M.D., Late Physician-in-Chief, Department of Physical Therapy, Boston City Hospital; Director of Physical Therapy, United States Army; Medical Counselor, United States Veterans' Bureau. Revised by William D. McFee, M.D., Visiting Physician, Department of Physical Therapy, Boston City Hospital; Attending Specialist in Physical Therapy, United States Veterans' Bureau; Consultant in Physical Therapy, Ring Sanitorium. Second Edition, Revised. 436 pages with 135 illustrations. Philadelphia and London: W. B. Saunders Company, 1932. Cloth, $6.50 net.

In 1929 there appeared on these pages a review of the first edition of Dr. Granger's book. This second edition has been revised and brought up to date by Dr. William McFee of Boston. The main substance of the book is unchanged but Dr. McFee has added such modern references as to that of Dr. Morton Smith's faradic unit for example. In particular has been added a chapter by George B. Rice, M.D., F.A.C.S. on Physical Therapy in the Treatment of Diseases of the Ear, Nose and Throat. The book remains, we believe an established authority on physical therapy and what may be reasonably expected from its various agents in certain selected diseases.

MASSAGE AND THERAPEUTIC EXERCISE: By Mary McMillan, Assistant at Sir Robert Jones' Clinic, Southern Hospital, Liverpool, England, 1911-1915; in charge of Massage and Therapeutic Exercise at Greenbank Cripples' Home, Liverpool, England, 1911-1915; Director of Massage and Medical Gymnastics, Children's Hospital, Portland, Maine, 1916-1918; Chief Aide, Walter Reed Army Hospital, Washington, D. C., 1918; Director of Physiotherapy, "Courses for Graduates," Harvard Medical School, 1921-29; Chief Physiotherapist, Peiping Union Medical College, Peiping, China. Third Edition, Reset. 359 pages with 124 illustrations. Philadelphia and London: W. B. Saunders Company, 1932. Cloth, $2.75 net.

With the mass of writing on the various phases of Physical Therapy it is with pleasure that we welcome this third edition of Miss McMillan's book. It is divided into two parts—the first on Massage and the second on Exercise—and goes effectively about its business of setting forth their technique and value.

Miss McMillan takes up the five fundamental strokes of Massage, describing each with its adaptations to the different areas of the body, and covering exceedingly well their particular therapeutic value. It is an interesting commentary that immediately after the first descriptive chapter on massage there follows one on active and passive joint movements; an excursion so to speak into the realm of exercise. Again it is an interesting commentary on the close relation between themselves and to the other physical therapeutic agents that we find her most naturally mentioning diathermy or interrupted galvanic. Chapters of exceptional value deal with such conditions as Volkman's Contracture, Torticollis, Amputations, Synovitis, Low Back Conditions and Arthritis.

The first chapter of Part Two deals in brief with the history of Therapeutic Exercise. Its last sentence contains the germ of all intelligently supervised activity. "A great thing for the physiotherapist to recognize is the time when passive work should cease and exercises replace the earlier therapeutic methods."

Concisely Miss McMillan deals with the mechanics of normal—or perhaps one should say "good"—posture and posture training including visceroptosis as well as the disalignment of the skeleton. Among various other conditions benefited by judicially prescribed and supervised

exercise are mentioned empyema, asthma, hernia, cardiovascular disturbances and conditions where neuromuscular coordination are lacking.

The book is clearly printed and well illustrated. Of special value is a carefully compiled index. In a brief appendix which is an answer to frequent inquiries Miss McMillan has given from her experience a list of minimum equipment for a gymnasium, an electrotherapy department and a hydrotherapy plant.

The amount of material so well presented is amazing and this small book makes an excellent reference for both student and graduate technician.

THERAPEUTIC USES OF INFRA-RED RAYS: By W. Annandale Troup, M.C., M.B., Ch.B. (St. And.); Author of Ultra-Violet Rays in General Practice and The Titanium Alloy Arc. Its Uses in Therapeutics; Honorary Consulting Electrotherapist to the Portman Hospital, Blanford, Honorary Physician to the Association of Retired Naval Officers, Member of the Honorary Advisory Editorial Board "The British Journal of Physical Medicine," Member of the Royal Institution. With a Foreword by Sir William Wilcox, K.C.I.E., C.B., C.M.G., M.D., F.R.C.P. Second edition revised and illustrated. London: The Actinic press, Limited. Price, 6/6 net.

Mr. Troup has brought to his public—the British medical world—the use of the infra-red rays in a general practice. He gives a brief survey of the physics, the therapeutics and the sources of the rays before he turns to the technique of their use. He compares the ultra-violet and the infra-red rays and treats upon their combination as therapeutic agents. Many case reports are quoted to show the reasonable use of this form of heat for "those minor and simple ailments which so frequently drag on (much to the annoyance of the patient) and defy other recognized forms of treatment."

DISORDERS OF SPEECH AND VOICE: By Robert West, Ph.D., Professor of Speech Pathology, University of Wisconsin. Madison, Wisconsin: Mimeographed by the College Typing Co., 1932.

A very careful study has been reported on the various causes of the disorders of speech, emphasizing that the end result is the subject for re-education only as it is considered as a part of the whole picture of the individual. The examination, testing, analysis and charting of findings are clearly described but the book brings a desire for a sequel on the approach and re-education for such a disorder.

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By John S. Coulter, M.D., Assistant Professor of Physical Therapy, Northwestern University Medical School, Chicago.

No. 8, Clio Medica: A Series of Primers on the History of Medicine, Published by Paul B. Hoeber, Inc. Cloth. Pp. 142, with 15 illustrations. Price $1.50.

This book may be purchased through the Business Office of

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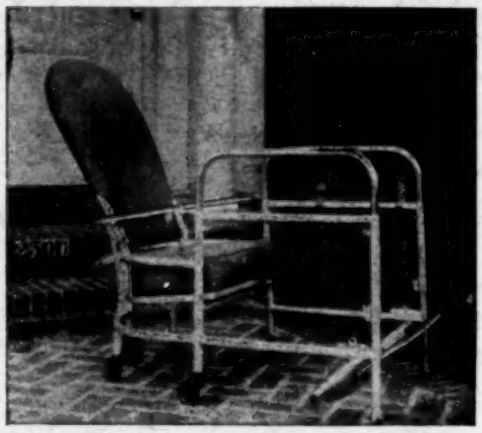

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